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Team-LRN

Basic Skills for College

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NEW YORK

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INTRODUCTION

SUMMARY

First, this chapter explains the rationale behind the testing methodologies used for college placement exams, and then it answers some FAQs (Frequently Asked Questions) that you may have. Next, you will also get a feel for what you should expect after the test, both academically and socially as you embark on the wondrous thing that is the college experience. Last, you'll explore the myths versus realities about college from those who have been there. So start making the most of your college days even before classes start.

P reparing to enter the world of higher education, whether at the local community college or a four-year liberal arts college or university, requires that you take a look at your abilities in the basic skills areas. Fundamental for success in any academic situation is knowledge of reading, writing, and mathematics. This is not to say that there aren't other important skills, but the foundation for the most effective learning rests on your ability to read with understanding, write with clarity and precision, and understand basic mathematical operations. These are the skills you'll use to build knowledge. They are also the skills that will be tested when you apply for college because just as you need to analyze your strengths and weaknesses in these areas, so do the schools where you plan to study.

Almost all institutions of higher learning require a placement test to determine your ability to handle college level English. Many schools accept a score on the verbal portion of the SAT or the SAT II essay, or an ACT score. These are nationally administered tests, and the scores are recognized as reliable indicators of your verbal abilities. However, if you haven't taken these tests or if you will be attending a school that requires an additional assessment of your skills, you will be asked to take a placement test. Usually, the institution you are planning to attend develops the test, and it is not part of the application process. Basically, it is used to provide you with a freshman English class that meets your needs and ensures that you get the instruction you need to be effective in all your courses.

Similarly, these schools look to the mathematics scores on standardized tests to access your level of knowledge and problem solving capabilities. If you haven't taken the SAT or ACT, your abilities can be gauged through a math college placement test.

FAQs

IS THERE A STANDARD TEST THAT COLLEGES USE FOR PLACEMENT?

There are several tests that a college may use for math placement. One test is called ASSET and another is called COMPASS. Additionally, colleges may design their own test to give to incoming students. You can ask your college if they use a particular test. Also, ask them if the test is given on the computer or with paper and pencil. Some computer tests may just be on-screen versions of paper tests. Other computer tests may be *adaptive*, which means that after you answer one question, the computer decides what question to give you next based on how well you answered the first. Adaptive tests are nothing to be afraid of. Just read and answer carefully, because you will not have the opportunity to double-check your work. Adaptive tests have the benefit of being relatively quick and painless.

DOES IT COST MONEY?

It is unheard of for a college to charge you an extra fee for a placement test. You should expect this test to be free.

WHAT SHOULD I BRING WITH ME ON THE DAY OF THE TEST?

You should bring ID (driver's license or equivalent), a number 2 pencil, and a calculator if permitted for the math portions, and you should know your Social Security number. Also bring any forms the school asks for.

CAN I USE A CALCULATOR FOR THE MATH SECTIONS?

Ask your school if calculators are permitted during the test. Some schools allow calculators, others don't. Don't be too upset if your school doesn't permit calculators. In this case, you should expect to see questions that work out "nicely," without elaborate scratch work and calculations.

IS IT A TIMED TEST?

Most tests give you a very generous time frame to work with. Ask your school what the time limit is, if any.

WHAT DO I NEED TO KNOW?

For the English test, you should feel comfortable responding to a given statement, or *prompt*. Most likely, you will also be tested on reading comprehension and language use (grammar, spelling, and so forth). For the math assessment, most schools test basic arithmetic and elementary algebra. Additionally, many schools test basic geometry. Ask your school for the specific sub-

ject areas that will be on your test, so that you can prepare accordingly.

HOW DO I PREPARE?

It is a good idea to brush up on the above-mentioned basic skills. This book is designed to walk you through sample questions and and to provide you with practice questions in the Skill Builder sections. After working through these sample essays, questions, and problems, you should take the end test. You can also ask your school if they have a sample test. Usually these sample tests are brief and do not come with detailed answer explanations. Comparing these specific sample tests to a book such as this one will allow you to focus and learn all the necessary material. Just be sure to practice under simulated test conditions. For example, if you will not have access to a calculator for the real test, answer all practice questions without a calculator as you study.

WHAT IF I FAIL?

Relax. You cannot fail a placement test. The whole rationale behind the test is to gauge the level of incoming students. Once your level of ability is assessed, your school will be able to place you into an appropriate class in a suitable track.

CAN I RETAKE IT?

Each school sets its own restrictions regarding retakes. For example, you might be allowed to take one placement test per term. Ask your school about their policy.

WHAT'S NEXT?

After the test, you should schedule an appointment with an advisor if one has not been scheduled already. Your advisor can give you information on registration and orientation.

MYTH VERSUS REALITY

MOST STUDENTS KNOW WHAT THEIR MAJORS WILL BE BEFORE THEY ENTER COLLEGE

First of all, you may be overwhelmed at the prospect of going to college. You may ask, "Is this school the right one?" "What will I major in?" "If I take the wrong classes, will I ruin the rest of my life?" Here's a secret: Most everyone entering college feels the same way. It's perfectly natural, and you are not alone.

Many students start school with an "undecided" major. Some say they know exactly what they want. In fact, you may hear, "I'm definitely going to be a doctor," or "I'm definitely going to be a lawyer, a veterinarian . . ." and they may even profess that their whole life is mapped out. However, sometime during the second year, when all the dust settles, those same people switch their majors. Once they have a taste of the courses needed to be a doctor, lawyer, and so on, they often decide they want to pursue another career. Don't let anyone intimidate you for being "undecided" at first. The best thing you can do for yourself is to sample a little of everything your first year and then make your decision.

IT'S BETTER TO BE A BIG FISH IN A SMALL POND THAN A SMALL FISH IN A BIG POND

Guidance counselors usually give this advice. It basically means that you are better off being a star at a small school than just being another faceless "number" in a large school. In reality, these are not words to take to heart. Even if you choose to go to a large school, you will ultimately choose a specific course of study, and each department has its own kind of family atmosphere. If you strive to be your best, you can always make your mark no matter what size school you attend.

Don't be afraid to get to know your instructors. In college, especially at a larger school, it is important to develop a good rapport with your professors as you pursue your studies. It is also a good idea to keep in touch with these professors because later you might need letters of recommendation from them. File these references in a special folder. The day will come when you will be very glad that you did.

YOU CAN TAKE ANY CLASS YOU WANT

This is mostly true. You generally have a great degree of control over your class schedule each semester. Many schools, however, have a large block of courses called the "core curricula" that all students must take. Schools want to make sure that your collegiate experience is a well-rounded one, so you will have to take certain humanities, fine arts, math, English, and foreign language courses, no matter what major you choose. Some schools even require physical education courses. The good part is that there is always a certain degree of choice involved. For example, if your school has a foreign language requirement, you will be able to pick which foreign language you want to study. Once you declare a major, there will be required courses for that major as well as electives—courses within the major that you pick yourself.

THERE IS ONLY ONE WAY TO STUDY

One student shares this method: "During my junior year I discovered a relatively painless way to do some studying. I would attend class with my 'scrap' notebook and scribble down everything my teacher was saying. Then when I returned to my room to study, I would get my 'real' notebook and copy everything I had written down, neat as a pin, with colors, highlighted, and so on." When you are sitting there just copying over notes it seems very easy, but you may not realize it all starts to sink in while you are doing this. And not only that, you have a nice, neat, organized book to study from later.

YOU DON'T HAVE TO GO TO CLASS

Your teachers will let you know, up front, what their attendance policies are. Smaller classes tend to have stricter attendance policies than courses held in large lecture halls. For the most part, you will find yourself attending class even if no attendance is taken, simply because you want and need to learn more than what you read or do on your own. Remember that whimsically taking a trip to the mall with your friends is not an academically sound reason for cutting class and is therefore not recommended. Some professors make it very clear that missing more than a limited number of classes without an approved excuse will result in an automatic failure for that course. They are not bluffing, and they are allowed to fail you if you violate their written policy. Don't waste your money by failing courses this way. Also, if you receive federal or state financial aid, you have to make "satisfactory academic progress" to keep that aid—which means going to class.

YOU WILL HAVE LOTS OF FREEDOM

This is definitely true. You won't be sent to the principal's office in college, although there are deans and judicial boards who control student discipline. You are in charge of yourself. So it's a good idea to follow your school's regulations. Too much freedom creates problems for freshmen when they forget that they are really in school to study and not to party. It is important to stay focused on your courses and not to get distracted by the many temptations that face you. With each course you take, you are presented with an opportunity to do your best. While classes are in session, make them the priority. You can reward yourself later with relaxation and recreation after the term is over.

YOU GET GREAT VACATIONS

This is true. The fall semester typically ends mid-December, and the spring semester starts in late January. Then the spring semester ends generally in mid-May. If you are not taking summer courses or working, you'll get one heck of a summer vacation out of the deal.

TO DO WELL YOU CAN'T HAVE A SOCIAL LIFE

This is not true. You do not have to forego all forms of socialization, but you need to balance your course load with your social activities. It would be unhealthy for you to *never* relax during the semester. Socialization is an integral part of your college experience.

GETTING 80% IS ALWAYS A B

One thing you may not have learned in high school is how grades are curved. A bell curve should represent the results of a test, with the highest percentage getting an average grade of C, a smaller percentage getting a B or a D, and a nominal percentage getting an A or failing. If you mapped it out on a graph it would look something like this:
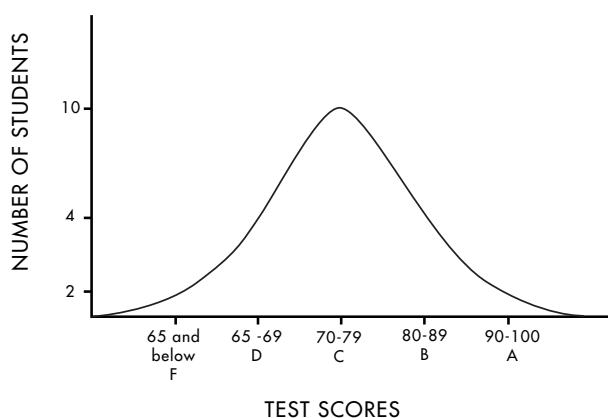
In some of your more difficult college classes, however, you may panic when you get your test back with a score of 40%, but then be very confused when you find out that's a C! Here's why. If a majority of the students get very low scores, the teacher will adjust the curve so it would look something like this:
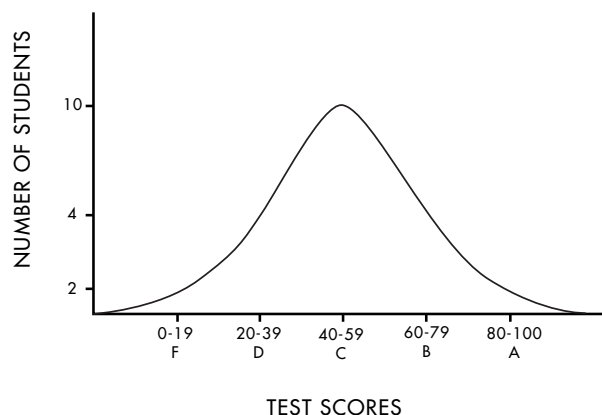
As an example, if you score a 79% on a test, but it is the second highest score in all four statistics classes (and the mean score was below yours), then your grade is actually an A++! So just remember, the curve is your friend. As long as you attend all the lectures and keep plugging away and ask for help if you need it, you're bound to pass any class you take. (This is not a guarantee, but it's a tried and true method that is a life skill.)

IT'S DIFFICULT TO MAINTAIN A JOB AND GET GOOD GRADES

For many students this is true. Be sure to balance your workload with your course load. If it is impossible to cut back on your hours at work, try not to burden yourself with a lot of credit hours. Doing well in college takes a commitment outside of the classroom. Make sure you can set aside enough hours to study for each course you enroll in.

## YOU ARE MISSING OUT ON A TRUE COLLEGE EXPERIENCE WHEN YOU LIVE AT HOME

This is not true. Your friend who goes away to school probably uttered these words. He may be the same one who finds that most of the residents go home on weekends, and the campus becomes as barren as a ghost town. As long as you pick a college that feels right to you, you will have a great college experience, on-campus or otherwise.

C·H·A·P·T·E·R

IMPORTANT WRITING PRACTICE

1
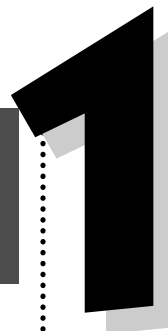
SUMMARY

Just as *you* need to analyze your strengths and weaknesses in writing, so do the colleges where you plan to study. Almost all institutions of higher learning require a placement test to determine your ability to handle college level English. Many schools accept a score on the verbal portion of the SAT, the SAT II essay, or an ACT score. These are nationally administered tests, and the scores are recognized as reliable indicators of your verbal abilities. However, chances may be that you have decided to go to school and you haven't taken these tests. Or, it could be that you will be attending a school that requires an additional assessment of your skills. In that case, you will most likely be required to take a placement test developed by the institution you are planning to attend. This placement test is not part of the application process. It is used instead of a placement test and provides you with a freshman English class that meets your skills needs. This helps you get the instruction you need to assure that you will be effective in all your courses.

The English placement test is almost always a writing test that requires you to provide an *on demand* response to a pre-selected *prompt*. The term *on demand* means that you must write your piece under specific time and place requirements, usually under the supervision of a proctor. This determines that your writing is yours and that you had no help. More important, it shows how well you can read and interpret the task and follow the conventions of standard written English to produce a well-organized response to a question of general interest. The question is called a *prompt* because it really isn't a question for which there is a right or wrong answer. Rather, it is written to prompt you to think about a topic or an issue of general interest to see what you think about it.

Generally, you will be given at least one to two hours to write, and a committee of English teachers will evaluate your writing. Your essay and circumstances (such as ESL) will enable them to determine whether or not you will be exempted from freshman English, required to take freshman English, required to take remedial English before you can take freshman English, or, in some schools, take a developmental class between remedial and freshman English. Sound confusing? Maybe. But it makes good sense.

Writing is the way you demonstrate your thinking in every subject you will study in college. In fact, a student's ability to write clearly is now recognized as the most accurate assessment of thinking and learning. If your writing skills are poor, or even just weak, chances are you will have a hard time understanding and then explaining what you have learned. No college wants to set you up to struggle and be unsuccessful in your courses as long as there are ways to help you. The English placement test is one way that your college helps you become the best student you can be in all of your classes, not just in English class!

CRITERIA FOR GRADING

Let's look at the criteria used to evaluate your English placement test. Many students believe that an error-free paper is the primary evaluation criterion. Error-free, of course, refers to obvious mistakes. A misspelled word, for example, is an obvious error. Other such obvious mistakes include punctuation (commas, periods, semi-colons, etc.), diction (word choice), sentence structure (comma splices, run-ons, fragments, etc.) and all the other rules of grammar. And, yes, these kinds of mistakes are very important, especially if there are patterns to your errors. That is, do you always misuse *to* for *too*? Do you always use a comma when you should be using a period or semicolon? Do you frequently have sentence fragments in your work? If you have answered yes to any of these questions, this is a good sign because you know where your errors are. However, errors in grammar are not the only—or even the most important—criteria for the evaluators.

The college readers also want to see if you can organize your thoughts into paragraphs. They want to see if you can develop an idea using details and examples. They want to see if your paper has a good beginning and a logical conclusion. In other words, can you write a well-organized essay on a topic of general interest in an *on demand* setting? Then, will a team of college English teachers be confident that you have the verbal and thinking skills necessary to succeed in a freshman English class?

If the screening committee decides that you do not have the skills, you will most likely be required to take your school's version of a *non-credit*-bearing remedial or developmental English class before you can take your first college level English class. The *non-credit* part is the key phrase. You certainly don't want to use up two or three credit hours—nor do you want to pay for them—if they aren't getting you closer to graduation. So you should take the placement test very seriously. You can't

study for it in the traditional way, but you can prepare, and that's what this section will help you with.

KNOW YOUR STRENGTHS AND WEAKNESSES

One of the first things you can do to help you understand yourself as a writer is to explore the way you feel about writing. A poll of college bound high school seniors revealed the following comments about writing:

> "I'd rather have a kidney removed!"

> "It makes your hand and your brain hurt."

> "Writing is pointless unless you're writing about something you feel like writing about."

> "My first thought is always, 'Ugh!' and then I start to write and I have absolutely no confidence in what I'm doing and then when it's all over I always feel I could have done better."

> "I get a feeling of dread when I have to start writing. I always feel overwhelmed at the beginning of the writing process and I feel inadequate when I have to write."

> "I feel scared, unprepared, and I just hope that my brain will come up with something good."

> "The worst part about writing is when you write a paper that you love and think is really good and then it gets trashed by your teacher."

> "I hate staring at a blank piece of paper or a blank computer screen with the knowledge that I am expected to fill it."

Did you notice how many different ways there were to say the same thing? All of the students quoted above share the same feelings about writing, and they are not happy ones. Generally, they feel unprepared and

uncomfortable. No matter what their intentions are when they sit down, they do not feel that they are in control of the outcome.

WRITING COMFORT LEVELS

To find your *writing comfort* level, answer *yes* or *no* to the following questions.

_____ **1.** Do I beg for time to write any place and any time other than where I am?

_____ **2.** Do I get a knot in my stomach before I begin to write?

_____ **3.** Do I just know that I am going to get it wrong or that I am doomed to fail or get less credit than I deserve?

_____ **4.** When I look at the blank paper, do I feel hopeless?

_____ **5.** Is "I don't have a clue where to begin?" my first thought?

_____ **6.** Am I unable to put my thoughts on paper because I know I may have trouble with spelling?

_____ **7.** When I feel confident that I have the answer or a worthy idea, do I feel angry because I just know that I'm going to mess up with the commas and the wrong words?

_____ **8.** Do I start to write and then search for words?

_____ **9.** Do I wish someone had taught me exactly what to do and what to say?

_____ **10.** Do I just write everything I know or think and hope the teacher will figure it out?

_____ **11.** After I write the answer and I read it over, I sometimes know it's not right. But I don't know where to look to make it better.

If you answered *yes* to most of these questions, you are not alone. Every, and I mean every, writer—whether a student hoping for a right answer or a new bride writing wedding thank-yous—confronts the same problems. But some writing situations are more stressful than others. When your college acceptance or placement depends on the quality of the writing you submit, the stress factor is considerable. Couple that with the fact that you will be writing about a topic you may have no interest in, under serious time constraints, and the stress mounts higher. But there are ways to reduce and control the stress. You've just taken the first step by reading this chapter.

By identifying the demons that interfere with your best writing efforts, you can begin to defeat them. Let's look at what most high school students said and how you answered the Writing Comfort Level questionnaire. You'll find that there were three general complaints:

- I have nothing to say.
- I search for the words and ideas when I finally do know what I want to say.
- I just know I made mistakes that will ruin my paper.

I HAVE NOTHING TO SAY

In college and beyond, you will have to write on demand about topics you would never choose for yourself. Placement essays also try to test under these same conditions, testing freshmen on what they *have* to write about, not what they *want* to write about, to assess how ready they are to perform on assigned, college-level work. Consequently, you may feel overburdened, angry, or even frustrated by the task. Your first task in becom-

ing a more confident and polished writer is to overcome the excuse factor and learn some techniques to get you started writing about even the most distant subject.

Consider this prompt, assigned as a general writing assessment in a freshman college English class. Its purpose was to enable the teacher to double-check the placement test and be sure that no one had been misplaced. It also helped her determine the ability levels of the group.

What makes you special? Each of us has unique abilities, aptitudes, or personality traits that make us special in some way. Prepare a 250–300-word essay that describes what makes you special.

First, a word about word lengths. They are *only* guidelines, and they are intended to be sure that you do not write too little or feel burdened to write too much. In the above case, the instructor wanted to be sure that someone didn't write three or four sentences and consider the task done. The word length was designed to encourage the writer to use examples and details. Typically, a page of double-spaced, one-inch margins, 12-point font text equals approximately 250 words per page. A handwritten page, double-spaced, has 140–150 words per page. So, the above prompt, written in a 50-minute period, should have produced two to three pages of handwritten text.

I SEARCH FOR THE WORDS AND IDEAS . . .

Back to the prompt. You read it and wonder what in the world you are going to write about yourself. You've never thought about yourself as special, and you certainly never considered that you could do anything that was unique. Writer's block starts to develop. The clock is ticking, and you still haven't moved the pen across the page. Where do you begin?

There are a number of *pre-writing* strategies that you could employ to get you started. For example, generate a list of nouns that describe you. Generate a list of hobbies, skills, and interests that occupy your time. You may even have experience with *clustering,* a way of mapping your ideas. But, because this is a timed writing exercise, you will need to move quickly with this personal brainstorming. Since the topic is of such general and personal interest you should not need a long time to come up with something to say.

For example, in response to the above prompt one student listed:

> I care too much about everything.
> I love talking to people.
> I play the guitar.
> I love to read.

And then he quickly decided that he could write a great deal about playing the guitar. So he began to write:

> I feel that the ability to play guitar makes me special because not many people have the time or willingness to learn how to play a musical instrument. So far it has taken me about six years of practice and I still believe that I am nowhere near where I would like my ability to be. However, every day of my life I take about two hours of time to play, whether I'm doing it while watching TV, playing in bands, or playing with friends. I feel that this dedication, not to mention all the money that I've put into buying four guitars and three amps since I first started playing, is what makes me unique.

This was the first paragraph of his essay. He went on to write the second paragraph about his dedication to the guitar detailing the time he spent practicing desp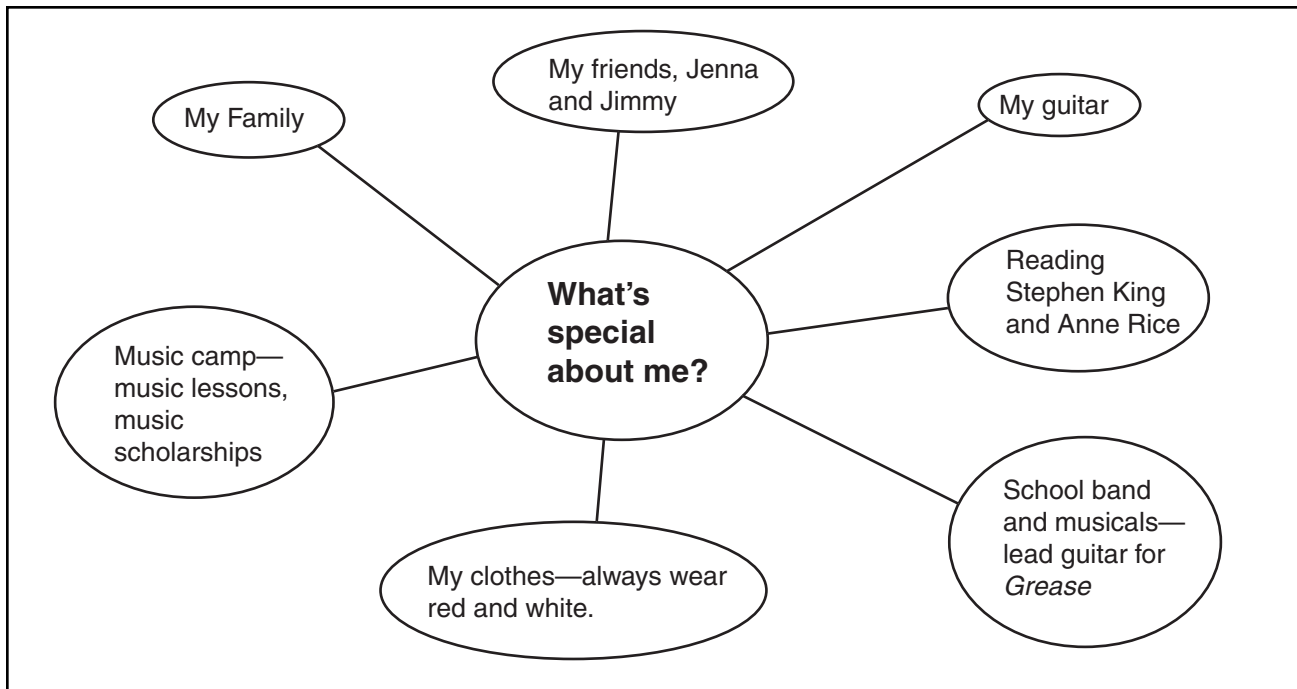ite a heavy work and study schedule. His third para-graph explained how he had advanced from a very inexpensive and basic guitar to some very professional equipment. His fourth paragraph described how much he enjoyed music, and he concluded with the following:

> And so you can see that the guitar is what makes me special. I know when I am playing that there are few others who have the ability to play as well as I do, not to mention the dedication to practice.

All in all, this was a satisfactory piece of writing which reassured the teacher that this student had been appropriately placed in freshman English. Here are the basic elements that the college instructor used to evaluate the piece:

1. The first paragraph gave clear indication that the student understood the prompt and had an organizational pattern for the piece. That is, the reader (the teacher) could expect that each paragraph would develop around the writer's dedication to music and then to the expense of his equipment.

2. The piece had two paragraphs in the body that did exactly what the introduction promised. First, the writer provided details about practicing the guitar, and second, he developed the idea that he had invested in expensive and professional equipment.

3. The conclusion summarized the main idea.

4. The paper was free of mechanical (grammatical) errors.

Yet another way to use prewriting for this prompt would be to create a cluster map that looks like the one on the next page.

```
                        My friends, Jenna
                          and Jimmy

   My Family                                                My guitar


                                                                      Reading
                              What's                                  Stephen King
 Music camp—                  special                                 and Anne Rice
 music lessons,               about me?
 music
 scholarships
                                                                   School band
                                                                   and musicals—
                                                                   lead guitar for
                     My clothes—always wear                        Grease
                     red and white.
```

You'll notice that the cluster map provided many more ideas than the list. The choice of topic was the same but the advantage to the cluster map is that it also provided details to choose from. For example, if the main topic is that guitar playing makes the writer special, then the body paragraphs can develop the ideas of playing for the school musicals, summer music camp, and the details of the music scholarship. In other words, the cluster map can easily be converted into a mini-outline before the essay is actually written.

In short, listing is a quick, easy way to jot down main ideas. The cluster map lets you jot down ideas in short bursts and write thoughts at random. Then you can go back and organize these scattered notes into something meaningful. Look at the opening paragraph that the cluster map might have triggered.

From my signature red and white outfits to my choice of reading material, I am a unique and special person. But my most special feature, my gift, is my ability to play guitar. I have played

for the school band as lead guitar in our most recent musical production of *Grease*; I have performed with the young adults concert band at Usdan, the summer camp for musically gifted teenagers which I attend every year, and I am always asked to play at parties for my friends and family.

You can see at once that the introduction is clear and precise about what the paper will develop, and it has a certain style that is created by the use of the details about dress and reading taste. We can expect this essay to develop more details about the musical *Grease*, the summer camp experiences, and the social performances. All in all, the first paragraph predicts a very good piece of writing.

Now examine this piece:

I'm not really sure if I'm special I like to think because I do ballet I am different from other girls my age. My friends also say I'm special to be able to be such a good listener and good

friend. I also went on a trip to Montana with my ballet class to go to a special ballet camp where I met this really great girl who was even better at ballet than me.

I love dancing and being in class listening to the music and watching the other girls dance is magic sharing the thing we love most in the world. To say the least I love ballet!

I also think I'm special and different because I am such a good friend that not a lot of people are. I can listen to a friend tell a story and never get tired and unhappy. The truth is my mother gets really mad at me because I spend to much time on the phone with other people she thinks I should spend more time with my family. My brother has always got things he needs help with and my mother wants me to take time with him helping him. Figuring out his problems and reasons why he should stay in school and not stay out all night with his friends and girlfriend. I know how important it is to stay in school and get a good education but my brother doesn't my mother says he needs to get his head on strait.

So I guess I'm special because I really love my family and friends and I always want to be able to help them when I can. Not everybody can be a good listener.

All in all, this is a marginal piece of writing. It will call the English teacher's attention to this student as a very weak writer in need of extra help. It might also warrant a special reevaluation of the student's placement and/or direct placement into a remedial program. Why?

1. Unlike the first piece, the first paragraph of this second piece is not an introduction for a longer, more fully developed idea(s). It skips from being a good friend to ballet to being a good listener for her brother. It sounds as if the writer's ideas streamed out of the pen when it hit the page and kept flowing until it was time to stop. In other words, it establishes no pattern of *organization* for the paragraphs to follow.

2. Despite the division of the composition into three paragraphs, there is no *development* for any of the ideas mentioned. There are no examples or details to support any of the examples mentioned. There are no transition words to help the reader understand the connections between the ideas.

3. The conclusion doesn't return to the introduction to bring closure to the piece. The last paragraph reads as if it begins a whole new idea, one not mentioned before.

4. There are *serious* mechanical errors.

Clearly, the writer of the second piece did not take the time to list ideas, or in any way preorganize the writing. The student started writing and as one thought led to another it appeared on the paper. Consequently, without taking the time to go back and revise this brainstorming, the writer was left with a very poorly written, error-filled paper. Both students had found something to say, but the first student presented his ideas in an organized, clear manner while the second student's paper needs to be developed and revised.

This leads back to the demons that plague student writers. Even when you have figured out that you do have something to say, and you attempt to say it, how can you be sure you've said it as well as you could have? Just what does "well" mean anyway?

I JUST KNOW I MADE MISTAKES THAT WILL RUIN MY PAPER

It always helps to know beforehand just how you are going to be evaluated before you begin any assignment, especially a writing assignment. What criteria will be used to judge your work? Most, if not all, English departments have set standards for evaluating student writing and most of the standards are very similar.

- *Higher Order Concerns.* In writing, this refers to elements of your work that contribute to the organization, content, and meaning. In other words, did your writing make sense? Did you understand and respond to the assignment correctly? Was your purpose clear? Did you convey information logically?
- *Lower Order Concerns.* In writing, this refers to the sentence structure, punctuation, word choice, spelling, and other elements of grammar and mechanics that can interfere with the adequate or effective communication of your ideas. Problems in this area are problems with the conventions of standard written English.

The concerns are labeled as higher and lower because the first category is considered more important, or higher in importance, than the second. Put another way, what you have to say and whether or not you have conveyed your message adequately is more important than a few spelling errors. In most cases, errors in grammar are not considered serious enough to warrant failure on a placement or diagnostic exam unless they are repeated consistently in a piece of writing. This indicates that the writer doesn't know the correct use, or the errors are so frequent that they interfere with meaning and then become higher order concerns.

Let's take a look at the grading criteria used by one college to evaluate incoming freshmen writing samples.

The criteria is very specific in addressing serious mechanical (lower order concerns) errors. They include:

1. sentence fragments
2. comma splices/run-ons
3. semicolon errors
4. subject-verb agreement errors
5. pronoun case errors
6. pronoun-antecedent agreement errors
7. double negatives
8. homonym errors which cause confusion
   Examples
   - are/our
   - there/their/they're
   - to/too
   - its/it's

Three or more such errors in a 500-word essay define the writer as one in need of remedial assistance; the paper cannot receive a passing grade. A remedial or developmental English class is then required before enrolling in a credit-bearing English class.

Not all schools, however, have such a defined pass/fail system of using the number of errors to grade a paper. In many cases, repeated syntax (sentence structure) errors would downgrade a paper from an A to a B or C or even a D or F depending on the frequency and/or repetition of such errors. In other words, serious mechanical errors will lower a grade or earn a failing grade in some schools, while in other schools the same errors will automatically trigger placement in a remedial or developmental class.

Less serious errors, but ones where recurrence makes them noteworthy, are:

1. omission of the question mark after a direct question

2. failure to capitalize at the beginning of a sentence

3. consistent failure to show possession with an apostrophe

While these seem like minor errors, they should not be taken lightly. In some cases, handwriting is a problem. If your handwriting is such that your capital letters are indistinguishable from the lower case, then your capitalization error may become a sentence error because it affects the reader's ability to understand your writing. So the use or misuse of apostrophes can also affect the reader's impression of your command of language.

But even if your paper is error-free, even if every sentence is complete, and there are no apostrophe errors and no semicolon mistakes etc., your paper could still place you in the remedial/developmental group. If the paper does not state a clear point of view or develop an idea with examples and details then your writing is not addressing higher order concerns. Remember that your reader is primarily interested in *what* you have to say, not just *how* you say it.

Consequently, your placement essay must have:

1. an introductory paragraph with a clear thesis statement.

2. paragraphs that develop the central idea, supply appropriate transitions, and use examples/details.

3. a concluding paragraph which summarizes the body of the paper.

4. control of the conventions of standard written English because without them you cannot write clearly.

SAMPLE WRITING TASK

Now let's take a look at a sample writing task, one very much like a placement essay question for a community or four-year college. Unlike the diagnostic sample cited earlier,

- the placement exam question will be more focused
- you will usually have a choice of topic
- you will usually have two hours
- you will be expected to be thoughtful and demonstrate that you are aware of current social and political issues

A common mistake that prospective test takers make is that they think this placement test is a trivial matter. They mistakenly believe that their high school English scores or SAT scores will count more than this test or that all they have to do is write *something,* anything, and as long as it seems to answer the question and seems long enough, it will be sufficient. This is one of those myths that makes its way around campus. A placement test is an extremely important opportunity for you to earn a place in a credit-bearing English class or be granted credit for freshman English classes—saving you time and money. Take care not to let the beach, work, or a babysitting appointment take priority.

PLACEMENT ESSAY SAMPLE

Select one of the following topics and prepare a 400–500-word response. Organize your thoughts and be sure to write in well-developed paragraphs following the conventions of standard written English.

1. School shootings have become all too common occurrences in the United States. What do you think has caused this problem, and what do you think can be done to prevent future tragedies?

2. Dress codes for public school students have become a number one priority for school boards across the United States. Why do you think dress codes have become an issue? Do you think they are an answer to school or society's problems?

3. Zero tolerance is a very controversial issue in many communities. What side of this issue are you on? Why?

4. "The President of the United States should be held to higher moral standards than the rest of the country. He should set an example." Do you agree or disagree?

5. Consider your experience with public education. What are the most pressing problems that you saw? How effective was the education that you received? If you were elected to your local school board what would be your first priority to fix?

In order to tackle one of these writing prompts, you should think about the five stages in the writing process. These are probably not new to you. They have become the accepted guidelines for writing, and they suggest ways for writers to progress through writing assignments. They are:

1. *Pre-writing*: This is the place where you think about what you are going to say. In the case of the essay choices above, this is where you will decide which topic you want to write about. You will ask yourself such questions as:
   - How much do I know about this topic?
   - What names or places can I associate with the topic.
   - What experiences have I had with the topic?
   - Do I care about this topic?
   - Where and when have I read or heard about this topic?

You may have learned these pre-writing strategies in high school.

- Brainstorm a list of ideas about the topic, or a list of facts you know.
- Brainstorm a list of questions.
- Create a cluster map to help you stimulate your thinking. This will help you with ideas, people, places, events, and/or readings from the newspaper or literature that are related to the topic.

You've looked at all the topics and you quickly decide that the one you know most about is the last one on public education. You begin a list:

My Experiences with Public School

1. I hated school.

2. It was crowded.

3. They made me take subjects I would never use.

4. The teachers were too busy to talk to me.

5. I never really learned anything useful.

6. There are a lot of serious drug and alcohol problems in schools today.

7. School shootings happen too often.

8. My guidance counselor was always too busy.

9. I couldn't ever get the classes I needed or wanted.

10. Nobody ever asked the kids what they thought was important.

You go back and look at your list, and you realize that there were several items that could be expanded. For example, you may think the idea that you never

learned anything useful is a concern for you as well as others. You develop another list that looks like this.

- I really wanted more foreign language classes, but they said budget cuts wouldn't allow for such small classes.
- I wanted to take two electives in my senior year but I could only take one because there weren't enough classes . . . again not enough money.
- My social studies class never really talked about current events, and I was interested in that.
- My English teacher never had time to really go over our papers because there were so many kids in the class.

You begin to see a pattern. You never learned anything useful because there never seemed to be enough money to provide the teachers and courses you wanted. You remember reading about money and education, and then you even vaguely remember hearing something about the new president promising more money for education.

Your topic then is: Problems in Public Education

2. *Rough Drafting*: Here's where you begin to draft your essay and decide exactly what you want to say about your topic. The first thing you want to establish will come from the brainstorming you have just done. You must create a thesis statement that will become the road map for your entire essay. In this case, your thesis statement, or what you have to say about the topic, will look something like this:

I have completed four years of high school and even though I had some great experiences there were many problems that I had to deal with. Public education today has a lot wrong with it because schools are overcrowded, money is not available to provide classes which students

need for the real world, and school can be a dangerous place.

Notice that the first sentence restates the topic in very general terms, and then the thesis statement becomes more specific. There are actually three parts to the thesis statement and each one can become a paragraph of the essay. A good rule of thumb to follow, to be sure you have an adequate thesis statement, is to use the word *because.* It will force you to define the reasons you intend to develop in the essay. If you then break each part of the thesis into a separate little essay, with supporting details, you will have the rough draft of your actual essay. Here is what it could look like.

PROBLEMS IN PUBLIC EDUCATION
There are many problems facing public education today. I have just finished four years of high school and I experienced some of those problems every day. Public schools are overcrowded, they cannot provide classes which students need for the real world, and they are not safe. If we don't do something about these conditions, there will be more school shootings and more students will drop out.

Public schools today are way overcrowded. There aren't enough teachers and there are too many kids in each class. Trying to go from class to class you realize that the halls are crowded and could be really dangerous. People get shoved and pushed and tempers get ugly. There are fights that break out all the time and sometimes those fights get carried away. You read in the newspapers all the time about school shootings and some of those serious incidents started in small ways because the school was just too big. My English class had

like 34 kids in it my teacher never could give us back our papers with comments on it. I wanted to learn more about why I only got 70's on my papers but she never had time for me with less kids she could have helped me more. In my Spanish class too. That lady just had too many students. I never got called on and never got to practice those verbs out loud. And I know its that way all over the place.

I never could take the classes that I really needed. They made me take these classes that I knew couldn't help me in the real world. I wanted to take more Spanish because they say that in the future everybody in this country will speak Spanish but my school didn't offer extra classes. When my mother went up to ask they told her it was budget cuts. And then I wanted another computer class but they said they didn't have money for them neither. I read about all this having no money for schools all the time in the newspaper. So how come we don't no have money? If I were on the school board I'd make sure there was money for Spanish classes and computer classes.

I also think that if kids had classes they wanted there wouldn't be so much trouble in school. Schools are dangerous with shootings and muggings and guns and if there is not money for classes there sure isn't enough money for security. They said in the news that the kids that did the shootings in Colorado got in with no trouble. They got in with all those guns and ammo and nobody saw them!

There are lots of problems in public education today and I saw three of them first hand such as is there enough money so that my school

won't be crowded and that the kids have classes they wanted and that the schools were safe.

Remember, this was a first draft and there are several good things about it. Notice that it does have a thesis statement or controlling idea, and it does have supporting paragraphs that provide details and examples. But it needs revising.

3. *Revising*: This is the stage in the writing process where you re-examine your writing to see if it says exactly what you want it to say. Here is where you will look to see if your paper has satisfied the assignment. This is where the real writing of your essay takes place. These are some of the questions you will want to answer when you revise:
   - Has my essay satisfied the assignment?
   - Do I have a clear thesis statement?
   - Do I have paragraphs that develop the thesis statement?
   - Are my paragraphs developed? Do they have examples? Are there transitions to help my reader understand my logic?
   - Is there a conclusion that restates the thesis?

Let's answer these questions. First, does the sample essay satisfy the assignment? Look again at the question. The essay does talk about problems in public education but it does not address what the author would do if he or she were a school board member.

Second, it does have a thesis statement with three ideas to be developed. Could those ideas be more clearly expressed?

Third, there are three body paragraphs, one for each prong of the thesis, but the second paragraph is not focused on one idea. It talks about class size and then goes into problems in the halls and then goes back to class size. It mixes in school shootings with the need for English teachers to have smaller classes to help students.

This paragraph needs to be broken into two paragraphs each with a clearer focus and development around one main idea.

Fourth, the paragraphs do offer examples and details, but the paragraphs, especially the second one, need to be reworked and *transitions* need to be added to give the entire essay a logical order and organizational pattern. *Transitions* are the words and phrases that move your essay from point to point. Words such as *first, second, third, then, also, consequently,* are examples of transitions.

And finally, the last paragraph tries to restate the opening but it is very awkward and confusing. It needs to be rewritten.

If we were using a standard set of criteria to evaluate this draft, it would be considered a marginal piece of writing. The author might be placed in a developmental writing class. However, if the student writer took the extra time, a little revising could save this essay from failure.

Here is a sample revision for the essay.

PROBLEMS IN PUBLIC EDUCATION

There are many problems facing public education today because overcrowding causes violence, large class size prevents real learning, and insufficient funding reduces meaningful course offerings. School boards must pay attention to these problems if we are ever going to solve them. I have just finished four years of public high school and I can speak first hand on each of these issues.

First, public schools today are overcrowded which leads to violence. Trying to move from class to class you realize that the halls are crowded and could be really dangerous. People get pushed and shoved and tempers get ugly. There are fights that break out all the time and sometimes those fights get carried away from school. You read in the newspapers all the time about school shootings and some of those serious incidents started in small ways because the school was just too big. School administrators don't want to care if the problem moves off school grounds but unless they make the schools smaller we could see more major crime in the buildings. If I were a school board member I would want to build more schools or hire more security so that a major incident like the one in Colorado doesn't happen in my school.

Second, there are too many kids in each class and because classes are overcrowded not enough learning goes on. My English class had 34 kids in it the teacher never could give us back our papers with comments on it. I wanted to learn more about why I only got 70's on my papers but he never had time for me with fewer kids he could have helped me more. In my Spanish class too. That lady just had too many students. I never got called on and never got to practice those verbs out loud. I know its that way all over the place, if I were a school board member I would hire more teachers and make classes smaller.

Yet a third problem with schools is that they don't offer the classes you need. I had to take classes that I knew couldn't help me in the real world. I wanted to take more Spanish because they say that in the future everybody in this country will speak Spanish but my school didn't offer extra classes. When my mother went up to ask why they told her it was budget cuts. And then I wanted another computer class but they said they didn't have money for

them either. If I were on the school board I'd be sure there was enough money for Spanish classes and computer classes so that students would be better prepared for their futures.

The three biggest problems in public education today are overcrowding which leads to violence, overcrowding which affects learning and insufficient money which limits courses for students. If I were a school board member I would be sure that there was enough money to correct all three of these problems.

The revision more closely follows the assignment because added references about being a school board member is an important change.

So, too, are the changes in transitions that provide better structure for the essay. By adding *first, second*, and *third* there is a more clear organizational pattern.

Finally, the last paragraph makes more sense. It is a clear restatement of the opening paragraph.

But there is still work to be done.

4. *Proofreading:* Now it is time to look for those lower order concern errors we talked about earlier. There are some serious sentence errors in this piece. Did you notice them? Many appeared in paragraph three. There is also an agreement error and an apostrophe error. Did you notice them?

There are seven sentences in paragraph three. Two are run-ons, one is a sentence fragment, and one is a comma splice. There is a pronoun/antecedent agreement error and there is also an apostrophe error.

- The first run-on is sentence two. There are three ways to correct a run-on: break the sentence into two by using a period, supplying an appropriate subordinating or coordinating conjunction, or by using a semicolon.

Let's take some time to correct these errors. Notice the suggestion before each correction.

INCORRECT

My English class had 34 kids in it the teacher never could give back our papers with comments on it.

CORRECT

1. (Create two separate sentences.)
   My English class had 34 kids in it. The teacher never could give back our papers with comments on it.

2. (Connect the two sentences with the coordinating conjunction *and.* Remember to add a comma before the conjunction.)
   My English class had 34 kids in it, *and* the teacher never could give back our papers with comments on it.

3. (Begin the two sentences with the subordinating conjunction *because.*)
   Because my English class had 34 kids in it, the teacher never could give back our papers with comments on it.

4. (Connect the sentences with a semicolon.)
   My English class had 34 kids in it; the teacher never could give back our papers with comments on it.

Now that you've read this sentence four times, did you notice the agreement error? *Papers* is plural but the pronoun that refers to them is *it* which is singular. The completely corrected sentence should include:

5. My English class had 34 kids in it, and the teacher never could give back our papers with comments on them.
   - The third sentence is also a run-on.

INCORRECT

I wanted to learn more about why I only got 70's on my papers but he never had time for me with fewer kids he could have helped more.

CORRECT

1. (Create two separate sentences. Remember to add a comma before the coordinating conjunction.)
   I wanted to learn more about why I only got 70's on my papers, but he never had time for me. With fewer kids he could have helped more. (Note: Connecting with a coordinating conjunction such as *and* would not fit the sense of the sentence.)

2. (Connect with the subordinating conjunction *so*.)
   I wanted to learn more about why I only got 70's on my papers *so* with fewer kids he could have helped more.

3. (Connect with a semicolon.)
   I wanted to learn more about why I only got 70's on my papers, but he never had time for me; with fewer kids he could have helped more.

   - The fourth sentence is a sentence fragment. That means that it is not a complete sentence and cannot stand alone. It has to be connected to the sentence in front of it or following it. Or, it has to be made into a complete sentence.

INCORRECT

In my Spanish class too.

CORRECT

1. (Create a complete sentence.)
   My Spanish class was also overcrowded.

2. (Connect the fragment with the sentence that follows.)
   Also, in my Spanish class, the teacher had too many students. (Note: The sentence that precedes, or comes before the fragment, is already too long to have something more added to it.)

   - The seventh sentence is a comma splice. That means that a comma was incorrectly used to separate two complete sentences. Either the sentences have to be made into two independent sentences, or they have to be joined with a semicolon or an appropriate conjunction.

INCORRECT

I know its that way all over the place, if I were a school board member I would hire more teachers and make classes smaller.

CORRECT

1. (Create two complete sentences.)
   I know its that way all over the place. If I were a school board member I would hire more teachers and make classes smaller.

2. (Connect the two sentences with the coordinating conjunction *and*. Remember to place a comma before the conjunction.)
   I know its that way all over the place, and if I were a school board member I would hire more teachers and make classes smaller.

3. (Connect the sentences with a semicolon.)

I know its that way all over the place; if I were a school board member I would hire more teachers and make classes smaller. (Note: Using a subordinating conjunction would not make the best sense in this case.)

Now that you've looked at this sentence five times did you notice another error? The apostrophe for the contraction *it's* is missing. The confusion of the pronoun and contraction *its* and *it's* is one of the most significant recurring errors in student papers. Always go back over your paper and circle the places where you have used *its.* Check to be sure you use the apostrophe if you mean *it is.* If it does not mean *it is,* then it is a pronoun. In that case, it *never* takes an apostrophe.

4. *Submitting Your Paper*: This is the last step in the writing process. You are ready to hand in your paper to be evaluated. If you have followed the steps in the process then you should have addressed those earlier demons. The *pre-writing* should have helped you think of something to say. The *rough drafting* should have given you some sense of content and organization. *Revising* should have helped you to identify and reword sections where your meaning was unclear or where you needed more specific details. The *proofreading* stage should have helped you identify errors in mechanics such as sentence structure, punctuation, and spelling.

WRITING FOR ALL YOUR COLLEGE NEEDS

Preparing for the college placement essay is a very important opportunity for you to understand your overall needs as a writer. You may be feeling that if you could complete all the stages and understand what to look for then you wouldn't need this book! Very often students know what to do, but they just do not allow for or take sufficient time to go through the steps.

The following criteria chart, also called a *rubric,* can help you identify the strengths and weaknesses in your writing. The five-point scale is a good overall gauge for you to follow. Five is an A or above average piece of writing for an entering college student. Four is a B or a better than average piece of writing for an entering college student. Three is a C or competent or average piece of writing for an entering college student. Two is a D and below average; it will identify a student in need of remedial or developmental assistance. One is an F and clearly not college level writing; it will definitely place the writer in a remedial class.

Now, let's return to the sample essay topics on pages 15–16. Write a practice essay and use the rubric on page 23 to help you evaluate your writing. Most important, though, find a friend who is a good writer to help you assess your work. Having a peer reviewer is an important part of the revision process, and unless you are working under *on demand* conditions, you should make peer review a necessary part of any written work you do.

Characteristic	5	4	3	2	1
Response to Assignment	Completely fulfills the assignment; may go beyond the requirements to a new level.	Fulfills all of the requirements of the assignment.	Fulfills most of the requirements of the assignment.	Fails to fulfill a major part of the assignment.	Does not fulfill assignment.
Thesis	Is clear, assertive, and original.	Is clear and assertive.	Is suggested but may be weak or unclear.	Is weak and/or unclear.	No recognizable thesis.
Development	Several strong supporting ideas are offered; each idea is thoroughly developed.	Several supporting ideas are offered; most are adequately developed, but one or two are underdeveloped.	Offers some supporting ideas but not enough to make a strong case; ideas may be underdeveloped.	Few supporting ideas are offered; the ideas that are provided are insufficiently developed.	Little or no support is offered; ideas are poorly developed.
Focus	All ideas are directly and clearly related to the thesis.	Most ideas are directly and clearly related to the thesis.	A majority of ideas are related, but there are some loose connections and/or digressions.	Some focus, but many ideas are unrelated.	No focus; most ideas are unrelated to the thesis or topic.
Argumentation	Addresses counterarguments, makes concessions, and establishes credibility.	Addresses counterarguments, establishes credibility for most sources; may neglect to make concessions.	Addresses most counterarguments but may neglect some major counterpoints; establishes credibility for some sources.	Fails to address most counterarguments; does not establish credibility for most sources; does not make concessions.	Does not address counterarguments, establish credibility, or make concessions.
Organization	Ideas are well-organized; good transitions throughout most of essay.	Ideas are well-organized; good transitions throughout most of essay.	Essay has organizing principle but pattern may be disrupted; some ideas are out of order; some transitions may be weak or missing.	Organizing principle may be unclear; many transitions are missing.	No organizing principle; weak or missing transitions throughout the essay.
Sentences	Ideas come across clearly; variety in sentence structure.	Most ideas are clear; may occasionally be wordy.	Sentences may be cluttered with unnecessary words or repetition; ambiguity may interfere with clarity.	Sentences are often wordy or ambiguous, interfering with clarity.	A majority of sentences are wordy or ambiguous, often interfering with clarity.
Word Choice	Precise and careful word choice; avoids jargon and pretentious language.	Most words are exact and appropriate; an occasionally ineffective word choice.	Mix of general and specific words; some pretentious language or jargon.	Mostly general, inexact words; word choice sometimes inappropriate.	Word choice often ineffective or inappropriate.
Grammar	Virtually error free.	A few grammatical errors, but none that interfere with clarity.	Several grammatical errors; may interfere with clarity.	Many grammatical errors; often interfere with clarity.	Most sentences have grammatical errors, often interfering with clarity.
Mechanics	Virtually error free.	A few mechanical errors, but none that interfere with clarity.	Several mechanical errors; some may interfere with clarity.	Many mechanical errors that interfere with clarity.	Most sentences have mechanical errors that interfere with clarity.

STUDENT PRACTICE SAMPLE ESSAY

Return to the sample essay questions on pages 15–16. Select one. Try not to use the one on public education because you have already seen some ideas that you could repeat. It's always better to start with a new idea. Allow two hours for the process from start to finish and see how you do.

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The following SAMPLE HELP PAGES will help you learn the steps to becoming a better writer. Use them as you complete a piece of writing.

PEER REVIEW SHEET

As mentioned earlier, having a friend or other experienced writer look over your work is an important part of examining the success of your rough draft. If you allow sufficient time, you can make this an important step for any writing task. But just finding someone who will tell you your work is good is not good enough. It may make you feel good, but it won't help get you from the C to the B or the A. It certainly won't help get you from the D or F to the C! So here's a peer review questionnaire that you should give to a friend to ask for ideas or suggestions.

PEER REVIEW

After reading the piece of writing completely, please respond to the following questions as an active and interested peer reviewer. As a reviewer, make note of anything you do not understand or that you feel is incorrect. Peer review helps both writer and reviewer. The writer can get helpful information about which parts of the essay are well received, and the reviewer can identify strategies that might work well for him. The key to effective peer review is honesty. Please complete the following review sheet. It will help any writer make improvements.

AUTHOR: _____

REVIEWER:_____

ESSAY TOPIC:_____

1. What is the THESIS STATEMENT? Copy it below.

   _____

   _____

   _____

2. How many paragraphs are in this essay? _____

3. Does the first paragraph adequately INTRODUCE the essay's subject matter and approach? _____
   Does the final paragraph adequately CONCLUDE the essay, reiterate the essay's main points and wrap up loose ends? _____
   Does the final paragraph introduce any new ideas? _____
   If so, what are they?_____

4. Is each paragraph in the body of the writing adequately DEVELOPED using the techniques mentioned below?
   Are there at least 5–7 sentences for each paragraph? _____
   How many pieces of evidence support whatever claim is being made in each paragraph? _____

Do you find the evidence compelling? If so, why? _____

Cite below at least two examples of evidence used in this piece of writing.

_____

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_____

5. Are the transitions clear? List below the transition statements that logically connect *each* paragraph and establish the organizational pattern in the writing.

_____

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_____

6. Which part or parts of the essay do you find most effective?

_____

_____

_____

On the lines below, cite a specific sentence, paragraph, or example that you believe is effective, and explain why you chose it.

_____

_____

_____

7.   Which part, sentence, or paragraph do you think needs more work because it is unclear or confusing or just doesn't sound right? Explain.

_____

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8.   Do you find errors in written English?   _____

Please look for the following and give examples from the writing to help the author in the revision process.

- sentence fragments

  _____

  _____

- comma splices

  _____

  _____

- semicolon errors

  _____

  _____

- subject-verb agreement errors

  _____

  _____

- pronoun case errors

  _____

  _____

- pronoun-antecedent agreement errors

  _____

  _____

- double negatives

  _____

  _____

- homonym errors which cause confusion i.e., are/our, there/their, to/too, its/it's, etc.

  _____

  _____

SELF CHECK REVISION SHEET

As you reread your work, be tough on yourself. Look at it from different perspectives to see if your reader may be confused by anything you have written. Your goal is to make your writing very, very clear. Before submitting your work, check the following:

_____ **1.** Can I easily identify (underline) my thesis statement?

_____ **2.** Does each paragraph begin with a recognizable topic sentence that introduces a major point to be developed in the paragraph?

_____ **3.** Can I identify (underline) transitional phrases in each paragraph?

_____ **4.** Are my pronoun references clear?

_____ **5.** Does my conclusion restate my thesis?

_____ **6.** Is my writing concise and exact?
- Do I use active voice where possible? That is, do I avoid the use of the verb _to be_, specifically _am, is, are, were, was, be, being, been_?
- Can any sentences be combined?
- Am I repetitious?

_____ **7.** Have I allowed time for peer review and further revisions?

If you have answered no to any of these questions, this is a good time to go back and revise your essay.

C·H·A·P·T·E·R
BASIC GRAMMAR
2

SUMMARY

Since grammar is commonly tested on college placement exams, this chapter takes you through several grammar exercises. When you complete the exercises, you can find the answers at the end of the chapter.

In Chapter 1, there was a list of the most common grammar errors typically found in student placement essay exams. Taken individually, these are the kinds of mistakes you may find on your paper and need to correct in your writing. Let's look at them again.

1. sentence fragments

2. comma splices and fused sentences

3. semicolon errors

4. subject-verb agreement errors

5. pronoun-antecedent errors

6. pronoun case errors

7. double negatives

8. homonym errors that cause confusion

SENTENCE FRAGMENTS

If it starts with a capital and ends with a period and it looks like a sentence, be careful! It may not be a sentence. It also needs a subject and a verb. The three most common errors that create a fragment are a missing subject, a missing verb, or a missing conjunction. For some samples, look at the sentences that follow. They begin with a sentence, but what follows is most definitely a **sentence fragment**. You'll find the fragments italicized. They masquerade as complete sentences, but they are really only parts of the sentences that come before them.

- What makes me special is the guitar. *Not my voice or my dancing!*
- I'm a good listener. *Especially to my friends and family.*

There are only two ways to correct a fragment. If we were to correct them, they would look like this:

- Make it a separate and complete sentence. For example:
  What makes me special is the guitar. It is not my voice or my dancing!
- Connect it to the preceding or following sentence with a conjunction or with proper punctuation. For example:
  I'm a good listener, especially to my friends and family.

Fragments can be hard to recognize because they are often phrases or subordinate clauses and they sound and look right. Examine the paragraph below and <u>underline</u> the fragments.

(1) What makes me special is that I have the ability to care too much about everything. (2) I am very compassionate. (3) Talking to people, noticing their reactions, sensing when they are happy or sad. (4) I love noticing people's reactions to words and situations. (5) Especially when they think I'm not looking. (6) I have a special ability to be a distant observer. (7) Off to the side. (8) Where no one is looking.

If you chose (3), (5), (7), and (8) then you were right on target. All three are fragments. Now write them correctly. You may have to do some rewriting to provide a logical connection for the fragments.

1. _____
   _____
   _____
2. _____
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3. _____
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4. _____
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   _____

Check the end of the chapter for suggested answers.

COMMA SPLICES AND FUSED SENTENCES

Correcting, even avoiding, sentence fragments could lead to two other common and major errors in sentence structure: the *run-on sentence*, sometimes called a *fused sentence*, or the *comma splice*. These are just fancy ways

to describe writing that ignores the independence of sentences and runs two or more sentences together without proper punctuation. You've heard the comparison between traffic signs and punctuation at least once in your English classes, but it is a comparison worth making again.

Imagine you are moving along in traffic and you ride right past the stop sign. You'd be lucky if there were no other cars on the road. So, too, if you run the red light. You might make it, but then again, what if you don't? It's easy to imagine the horror of a traffic accident that damages your car or even injures you, but it's hard to compare such mayhem to a simple piece of writing. But that piece of writing could mean a great deal to your success, whether it's a placement essay that will save you money and time or a cover letter for a resume that could land you a job. So, if you run one idea into the next, and you confuse your reader so much that he or she gives up, then you have created mayhem. Try reading the following passage from a student essay on legalizing marijuana.

> Marijuana, just like alcohol, has been used worldwide for centuries. It has been used for medicinal purposes, sacred ceremonies, and relaxation, most common today would be medicinal and relaxation, it is proven that marijuana aids in headaches, various aches and pains, anti-nausea, glaucoma, and sleep deprivation. Although this drug is a cure-all it does have an intense effect on your body, unlike alcohol marijuana gives you a calm, soothing feeling, marijuana does have defects. Such as lung cancer and various cancer causing chemicals these chemicals are also used to make its effects intensified. I believe if the United States legalized marijuana the outcome would be more positive than negative.

How many times did you have to stop and reread to try to decide what the author really meant or was trying to say? That's your first clue that something is seriously wrong with this piece of writing. But look at what simply stopping for the red lights and stop signs does to improve the sense of this paragraph.

> (1) Marijuana, just like alcohol, has been used worldwide for centuries. (2) It has been used for medicinal purposes, sacred ceremonies, and relaxation. (3) Most common today would be using marijuana for medicinal and relaxation purposes because it is proven that marijuana aids in relieving headaches, various aches and pains, nausea, glaucoma, and sleeplessness. (4) Although this drug is a cure-all, it does have defects; marijuana has been linked to lung cancer and it does contain various cancer causing chemicals to intensify its effects. (5) However, I believe if the United States legalized marijuana the outcome would be more positive than negative.

There are three basic ways to correct sentences that run together.

- Come to a complete stop. Use a period and create two separate sentences. This is what was done between sentences (2) and (3).
- Slow down and look both ways. By using the conjunction *because,* sentences (3) and (4) were connected logically, and the reader was able to move with understanding on to the next sentence.
- Slow down. A semicolon lets you know that the next sentence is directly related to the one that precedes it. Look for the connection. By ending sentence (4) with a semicolon the writer is telling us that sentence (5) is going to specifi-

cally develop what sentence (4) started already. In essence, you should see a connection about the defects. In most cases, the period and the semicolon are interchangeable and the writer determines where the emphasis should go. Just be careful. A semicolon separates two complete sentences that are closely related to each other. Closely related is the key phrase here. However, you cannot use a semicolon to connect a fragment to a sentence. See the section on semicolon errors that follows!

You should also notice that in correcting the obvious sentence errors, *transitions* were used to create bridges to connect the sentences and establish stronger logic. For example, *although* and *however* in sentences (4) and (6) helped to correct the sentence errors by creating separate sentences and making the author's point more clear. In the next paragraph, underline and correct the following student sentence errors, all found in a piece of writing by an entering community college freshman.

(1) Cigarette smoking should be banned from all public areas, it is a foul and disgusting habit. (2) It should be banned altogether, cigarettes are dangerous to both the smokers and the people near them. (3) Another reason to ban smoking is because it is disrespectful to others why would anyone deliberately want to show such disrespect cause anger and hostility when trying to enjoy a meal or performance? (4) As to why smokers smoke, it is still a mystery even to them. (5) Public areas are where people come to enjoy themselves; not to be bothered with cigarette smoke.

On the lines that follow, correct any sentence fragment errors that you find using proper punctuation or conjunctions.

1. _____
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2. _____
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3. _____
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4. _____
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Check the end of the chapter for suggested answers.

SEMICOLONS

Because the semicolon is one of the corrections for the comma splice or the fused sentence, you have to be careful that you are not substituting one mistake for another. You cannot just insert a semicolon in place of a period or a comma. The semicolon has only two uses:

1. The semicolon separates *closely related* sentences. Notice the words *closely related*. You cannot separate any two sentences with the semicolon. A good rule to follow is to consider using the semicolon only if there is a coordinating conjunction that could be used instead. For example:

Marijuana is most commonly used today for medicinal and relaxation purposes because it is proven to relieve pain.

OR

Marijuana is most commonly used today for medicinal and relaxation purposes; it is proven to relieve pain.

2. The semicolon separates elements in a sentence that already uses commas. For example:

Marijuana is most commonly used today for medicinal and relaxation purposes. It is proven to relieve the pain from headaches, glaucoma; nausea from chemotherapy, motion sickness; insomnia caused by stress and worry.

Examine this paragraph and try using semicolons to replace coordinating conjunctions.

(1) Most people began smoking when they were teenagers and they were unaware of the long-term health consequences they faced. (2) They were more concerned with looking grownup and trying to imitate the movie stars or television personalities they saw. (3) As they began to realize the damage that they were inflicting on their bodies they tried to stop but it proved impossible for most of them. (4) The addictive properties of nicotine were too difficult to overcome and despite heart and lung damage they continued to light up. (5) Unless the tobacco industry gets serious about advertising the negative consequences of cigarette smoking more and more teenagers will start up everyday and as they enter adulthood these teenagers will be facing serious future health problems.

Check the end of the chapter for suggested answers.

In most cases, you should use semicolons infrequently. Try to write good sentences that are clear and independent and that are connected by logic and consistency.

SUBJECT-VERB AGREEMENT ERRORS

There is no mystery to **subject-verb agreement**. The subject and the verb must agree! "That's great," you say. "But what if I don't know my subjects from my verbs?" The likelihood is that you do know the difference. It's when the subject and verb are separated or for some other reason not obvious to you that you can make an error. For our purposes, we will examine the two most often repeated subject-verb agreement errors.

1. When the subject and the verb are next to each other there is usually no problem.

    The words are carved above the main entrance to the Supreme Court.

    The words Equal Justice Under Law is carved above the main entrance to the Supreme Court.

    When the subject, *words*, is close to the verb, *carved*, the plural is obvious: *are carved*. But when the subject is separated from the verb, a mistake can easily be made, as is the case in the example above. The verb should not be *is carved*; it should still be *are carved.*

2. A compound subject, that is a subject with two parts joined by *and,* requires a plural verb.

    Kevin and Michael work at the same computer repair shop.

    Kevin and his two friends work at the computer repair shop.

    His two friends and Kevin work at the computer repair shop.

In contrast, if only Kevin worked at the computer shop, the sentence would read:

Kevin works at the computer repair shop.

3. Subjects joined by either/or, neither/nor require a singular verb.
It is either Kendra or Zoe who is bringing the volleyball to the picnic.
Neither Michael nor John is studying enough for the driver's test.

PRONOUN-ANTECEDENT ERRORS

Now just what is an **antecedent** you ask? Simply stated, it is the noun that comes before the **pronoun.**

Elliot walked his dog in the park.

Elliot is the *antecedent* for the pronoun *his.*

It sounds simple enough, but it gets more complicated as a sentence becomes longer and as the noun (antecedent) moves further and further away from its pronoun.

Elliot, whose dog's name is Kodak, walked him every day with his next-door neighbor's dog, Molly, in the park that adjoined their house.

The pronoun which is incorrect in the above sentence is *their.* It refers back to the noun (antecedent) Elliot and therefore, the pronoun should be *his,* not *their.*

Read the following sentences and correct any pronoun-antecedent errors.

1. From where Matthew and Candace lived, you could see the river.

2. The class was the largest one in the history of the school, and they were determined to be the best.

3. When a person is really anxious for an education you should let nothing stop you.

4. Running a computer too long forces them into sleep mode.

5. Swimming across a river like this is difficult because they have such strong currents.

Check the end of the chapter for suggested answers.

Just when you think you may understand this pronoun/antecedent thing, there is a variable that is going to really confuse you a bit. As a matter of fact, it is so often confused that the English language is actually changing because so many people get it wrong! But until it's officially changed you should know the right from the wrong, so here goes.

Any, anybody, everyone, everybody, and any other such indefinite pronoun (indefinite because it isn't definite whether it's singular/plural, masculine/feminine) is an antecedent that requires a singular pronoun.

Will everybody please take his/her seat.

NOT

Will everybody please take their seats?

Now that just doesn't sound right, does it? And that's probably why you will see incorrect usage in newspapers, magazines, textbooks, and in the speech of newscasters, journalists, and teachers. But it is correct, and the confusion comes from a shift in the way society is now emphasizing *gender neutral* language. If you must use a singular pronoun then which one do you choose? Masculine *his* or feminine *her?* The answer in the twenty-first century is *both,* and that can make for some pretty awful-sounding language. Well, you only have three choices. First, recognize that you need a sin-

gular pronoun and then decide if the group you're addressing is masculine or feminine in order to use the appropriate pronoun. Second, use both pronouns. Third, rewrite the sentence to eliminate the indefinite pronoun antecedent.

Try these:

1. *Anyone who wishes to hand in (his/her/their) paper now may do so.*

   If the teacher is addressing a class of all boys, then the correct pronoun is *his.*

   If the teacher is addressing a co-educational class then the answer is *his/her.*

   OR

   You may hand your paper in whenever you wish.

Notice that by rewriting the sentence using the noun/pronoun combination *you/your,* you have established *gender neutrality* and eliminated the need for the masculine or feminine pronoun. Try these on your own. Circle the correct bold word.

2. Everyone who participated received a prize for (**his/her/their**) part in the production.

3. Everybody going on the ski trip should wax (**his/her/their**) skis.

4. Any student who is late will have to take (**his/her/their**) makeup exam during vacation break.

5. Any person who wishes to become a journalist should make sure that (**he/she/they**) will be prepared to accept the challenge that journalism offers.

   Check the end of the chapter for answers.

DOUBLE NEGATIVES

This is one of the easiest principles of grammar to understand, and yet we still make mistakes with it.

I haven't got no time to play.

No problem recognizing this as an error. The double negative is so close together that it's hard to miss. If I have *not* got *no* time then I must have some time. The **double negative** makes it a positive.

The problems arise when the sentence becomes more complex and the elements of the double negative are separated.

Some people are naturally gifted climbers and they have scaled no trees and climbed no mountains that gave them no fear at all.

Do you see the double negative? If they scaled *no trees* and climbed *no mountains* which gave them *no fear* then they must have scaled and climbed and had fear. The sentence should be rewritten:

Some people are naturally gifted climbers and they have scaled trees and climbed mountains that gave them no fear at all.

OR

Some people are naturally gifted climbers and they have scaled no trees and climbed no mountains that gave them fear.

Try correcting these. If the truth be known, all errors with double negatives were found in some college freshmen papers on the subject of human cloning.

1. The author's main point throughout is not that human cloning would not diminish family bonding but that it would destroy family relationships.

2. Physicians do not have no time for mistakes in their research on this topic because no human life is up for sacrifice.

3. There were too many errors in experiments on mammals and no doctor can be sure that he will create no deformed humans with these experiments.

4. No clones will have no unique identity therefore no clones will be individuals.

5. If we wait for perfect animal results then no human cloning experiments will have no chance of happening any time soon.

Check the end of the chapter for suggested answers.

HOMONYM ERRORS AND WORDS WITH COMMONLY CONFUSED SPELLINGS

Who really cares if you meant *their* but wrote *there*? Your reader can figure it out, right? Think again. The simple confusion of words that sound the same but mean something very different causes immediate confusion for your reader. In addition, the mistake represents a glaring error that should send you running for a dictionary. The following sets of words are some of the most common homonyms and words commonly confused that you MUST learn.

accept/except	knew/new
affect/effect	loose/lose
aisle/isle	passed/past
altar/alter	patients/patience
altogether/all together	perspective/prospective
always/all ways	pray/prey
angel/angle	principal/principle
complement/compliment	right/write
decent/descent/dissent	there/their/they're
desert/dessert	threw/through/thorough
dyeing/dying	to/too/two
formerly/formally	weak/week
forth/fourth	weather/whether
gorilla/guerrilla	who's/whose
its/it's	your/you're

Now try these sentences on your own. Circle the correct choice.

1. He couldn't decide (whether/weather) to take his umbrella.

2. I hope it was the (principle/principal) of good behavior which guided her actions.

3. Not many mathematicians have the (patients/patience) to work on Fibonacci's theorem.

4. The plane's (angle/angel) of descent was hard to determine.

5. (Their, they're, there) will be little trouble finding the right spot.

6. (Gorilla/guerrilla) warfare is how we characterize the internal fighting in some South American countries.

7. (Passed/past) practices will determine the arbitrator's decision.

8. (Accepted, excepted) by three schools, the graduate had a major decision to make.

9. It was hard to see how many balls went (threw/through) the net.

10. (It's, its) almost too much to take!

Check the end of the chapter for answers.

There are other demons to overcome when writing, but these are the most common. You may wish to review apostrophe use, capitalization, and quotation marks on your own.

A list of resources to aid you includes:

501 Grammar & Writing Questions. New York: LearningExpress, 1999.

1001 Vocabulary & Spelling Questions. New York: LearningExpress, 1999.

Chesla, Elizabeth. *Write Better Essays in Just 20 Minutes a Day.* New York: LearningExpress, 2000.

Olson, Judith F. *Grammar Essentials, 2nd Edition.* New York: LearningExpress, 2000.

Vocabulary & Spelling Success in 20 Minutes a Day. New York: LearningExpress, 1998.

Writing Skills Success in 20 Minutes a Day. New York: LearningExpress, 1998.

TEST YOUR SKILLS

PRACTICE TESTS IN GRAMMAR
SENTENCE STRUCTURE

There are ten errors in sentence structure in each of the paragraphs below. Circle them and then rewrite them. Remember: a sentence must have a subject and a verb; a comma cannot separate two sentences; only semicolons, periods, or conjunctions can separate sentences. If you do not own this book, write your answers on a separate piece of paper.

NEW YORK, NEW YORK

(1) New York City is one of my favorite cities to visit. (2) The museums and art galleries are amazing. (3) Too big and too diverse to see all in one trip. So, I have been back many times. (4) Not just for the art. (5) I like the restaurants, I like the department stores, I like the theater. (6) I saw four different Broadway plays. (7) Last time I was there. (8) I also went to Shea Stadium and saw the Mets play. (9) They lost but it was a great game. (10) Very crowded. (11) And the subway ride going back to my hotel was very interesting. (12) Although not very safe. (13) I felt very overwhelmed by the crowded platforms, the people were pushing and shoving. (14) I was afraid I would be hurt. (15) At the very worst mugged and robbed. (16) All in all the good outweighs the bad, I'll go to New York any time!

COLLEGE VISITATIONS

(1) When visiting colleges my parents and I traveled to five different schools. (2) Each in a different city. (3) Each a very different kind of school. (4) We visited a very large school, we saw a very small school. (5) We went to a big city, a small city, and a small town. (6) We saw schools with huge libraries. (7) Two had libraries that were almost all online. (8) Very few books and no magazine collections at all. (9) The magazines were all online a good thing because it makes it easier to read more magazines more easily when you're doing research. (10) The schools I liked best were the two smallest ones they made us feel most welcome, I really liked the kids who took us

around. (11) Fitting in wouldn't be a problem for me. (12) Dress was a major similarity. (13) I also realized that the weather was good at one because it was winter the snow was minimal and I hate snow. (14) So much for the University of Buffalo!

Check the end of the chapter for suggested answers.

SUBJECT-VERB AGREEMENT

Circle the correct verb choice in each of the following sentences. If you do not own this book, write your answers on a separate piece of paper.

1. Playing a musical instrument (help/helps) in the development of abstract thinking skills.

2. The school board (has/have) announced that a new contract has been approved.

3. A number of the students (has/have) joined together to form a club for hockey fans.

4. Neither the American Surrealists nor Lee Krasner (was/were) able to anticipate Jackson Pollock's impact on the art world.

5. The number of fans that follow the musical group *Five for Fighting* (has/have) steadily increased.

6. The committee, after weeks of planning, (has/have) failed to arrange for a guest speaker.

7. An amazing discovery which shed light on the origins of early religious thinking (was/were) the Dead Sea Scrolls.

8. Each of the cookie types sold by the Girl Scouts (has/have) a loyal following but Thin Mints (is/are) the most popular.

9. The English Department chairman (has/have) final say in whom is exempt from the final.

10. Al Gore and George W. Bush (was/were) eager for the 2000 presidential election to be finalized.

11. In the play, *Hamlet*, Ophelia, Gertrude and Claudius, along with Polonius, (think, thinks) Hamlet is insane.

12. Some of the characters in the play (fear/fears) Macbeth, but no one (love/loves) him as much as Lady Macbeth.

13. In Camus' novel, *The Stranger*, neither Mersault nor Raymond (plot/plots) the murder of the Arab.

14. The box of tissues (was/were) nearly empty.

15. The South American political crises (is/are) the concern of North Americans.

16. He discovered that his major hypotheses (was/were) not supported by current research.

17. Only one of the many problems (was/were) solved.

18. A collection consisting of four paintings by Manet and two by Gauguin (was/were) donated to the museum.

19. Salad and dessert (is/are) included with dinner.

20. Every powerboat and sailboat on display at this boat show (sell/sells) for over $10,000.

21. Every rooftop and tree (is/are) covered with snow.

22. Either the manager or his assistants (review/reviews) the company's personnel needs.

23. The treasurer of several campus organizations (graduate/graduates) today.

24. Almost every one of the people standing in the aisles at the concert (remain/remains) until the last song is sung.

25. The team of astronauts and research scientists on the shuttle (report/reports) to the press today.

Check the end of the chapter for answers.

PRONOUN-ANTECEDENT AGREEMENT

Circle the word or words that correctly complete the sentence. If you do not own this book, write your answers on a separate piece of paper.

1. Everybody on board was terrified that (he/she, they) would die if the boat capsized.

2. Nobody was prepared to accept responsibility for (his/her, their) share of the problem.

3. Bill Gates, in addition to the four other corporate officers of Microsoft, wants to see (his/her, their) company as the giant of the computer world.

4. If a person is applying for a job, (he/she, you) should dress properly.

5. As we entered the stadium, (we/you) could hear the music blaring.

6. Would anyone like to ask (his/her, their) question now?

7. Everyone please take (his/her, their) belongings when you leave the room.

8. Nobody should be using (his/her, their) textbook for this exam.

9. None of the students left any doubt as to whether or not (he/she, they) enjoyed this class.

10. The principle of the issue is still over legalizing the right to help someone end (his/her, their) life.

Check the end of the chapter for answers.

WORDS COMMONLY CONFUSED

Circle the word or words that correctly complete the sentence. If you do not own this book, write your answers on a separate piece of paper.

1. It isn't easy to accept defeat when (its, it's) not in your best interest.

2. If it had not been for the (principle, principal) of the issue I would have given them (they're, their, there) share of the prize.

3. The new lipstick that she was wearing (complimented, complemented) her dress.

4. Of course, (its, it's) never easy to discuss your least favorite relative.

5. Doctors are overburdened with (to, two, too) many (patients, patience).

6. They're too quick to complain about (weather, whether) or not (its, it's) time to move on.

7. She threw the biggest graduation party only to find out that she hadn't (passed, past) her final exams.

8. It isn't hard (to, too, two) make room for (desert, dessert) when you are still hungry after dinner.

9. Global warming will have profound (effects, affects) on human life in the next century.

10. Always the one to complain, he decided that the only way to (alter, altar) his working conditions was to join the policy board.

Check the end of the chapter for answers.

PROOFREADING AN ACTUAL ESSAY

It's much easier to spot errors when you know what you are looking for than it is to find them in the context of an actual essay. In the piece below there are errors in sentence structure, agreement of subject/verb, agreement of pronoun/antecedent, and words commonly confused. See if you can find and correct them. Circle the errors and then rewrite the passage on the pages that follow. Compare your rewrite with the revision at the end of the chapter.

COURAGE

(1) Courage can be shown in many ways and by many kinds of people. (2) One does not have to be rich, or educated, or even an adult to show true courage. (3) For example, a very heartbreaking thing happened in our family. (4) It turned out all right but at the time everyone in our family was about to lose their faith. (5) It also taught us a lesson regarding courage and the affects that a serious conflict can have on a family.
(6) In spite of his father's and his mother's repeated warning, Matt went ice skating with his cousins and he fell through the ice into the frigid water. (7) He often did things he was told not to do. (8) Like the time he took off on his motor bike in the rain. (9) Or the time he insisted on walking home well past dark. (10) But this time was life threatening even his friends doubted his common sense.
(11) Fortunately, there were grown-ups near and they were able to throw him a lifeline and pull him to safety. (12) However, when they got him to shore he was unconscious there were vital signs but they were weak; the paramedics pronounced him in great danger. (13) He was rushed to the hospital fighting for his life.
(14) He is his little sister's hero. (15) Matt is 16 and Nan is 13 she admires everything he does. (16) She stayed at his bedside for three full days until he woke up, Christmas had already past. (17) But her smiling face was the best Christmas present for Matt and knowing that her hero was going to be fine was a wonderful present for Nan to. (18) To this day everyone tries to figure out who was the real hero, who had the most courage, who learned the most. (19) What we all did learn was that courage comes in many forms. (20) Matt never ice skated again, Nan kept him as her hero, our family regained it's faith.

Check the end of the chapter for a suggested revision.

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ANSWER KEY

SENTENCE FRAGMENTS

1. I love talking to people, noticing their reactions, and sensing when they are happy or sad.

2. I love noticing people's reactions, especially when they think I am not looking.

3. I have a special ability to be a distant observer, off to the side, where no one is looking.

SENTENCE ERRORS

1. Cigarette smoking should be banned from all public areas. It is a foul and disgusting habit.

2. It should be banned altogether. Cigarettes are dangerous to both the smoker and the people near them.

3. Another reason to ban smoking is that it is disrespectful to others. Why would anyone deliberately want to show such disrespect or cause anger and hostility when trying to enjoy a meal or performance?

4. Public areas are where people come to enjoy themselves. They do not want to be bothered with cigarette smoke.

USING SEMICOLONS

There are several ways to correct the sentence errors in this passage. This is one possible revision.

> Most people began smoking when they were teenagers; they were unaware of the long-term health consequences they faced. They were more concerned with looking grownup and trying to imitate the movie stars or television personalities they saw. As they began to realize the damage that they were inflicting on their bodies, they tried to stop, but it proved impossible for most of them. The addictive properties of nicotine were too difficult to overcome. Despite heart and lung damage they continued to light up. Unless the tobacco industry gets serious about advertising the negative consequences of cigarette smoking, more and more teenagers will pick up the habit every day. As they enter adulthood these teenagers will be facing serious future health problems.

PRONOUN/ANTECEDENT ERROR

1. From where Matt and Candace lived, they could see the water.

2. The class was the largest one in the history of the school, and it was determined to be the best.

3. When a person is really anxious for an education, he/she should let nothing stop him/her.

4. Running a computer too long forces it into sleep mode.

5. Swimming across a river like this is difficult because it has such a strong current.

DOUBLE NEGATIVES

1. The author's main point throughout is that human cloning would destroy family relationships.

2. Physicians do not have time for mistakes in their research on this topic because human life cannot be sacrificed.

3. There were too many errors in experiments on mammals and no doctor can be sure that he will

not create deformed humans in these experiments.

4. No clones will have unique identities therefore no clones will be individuals.

5. If we wait for perfect animal results then no human cloning experiments will happen any time soon.

HOMONYM ERRORS

1. whether

2. principle

3. patience

4. angle

5. there

6. guerilla

7. past

8. accepted

9. through

10. it's

PROOFREADING

There are several different ways to correct the sentence errors in the next two passages. Below you will find two possible rewrites.

NEW YORK, NEW YORK
New York City is one of my favorite cities to visit. The museums and art galleries are amazing but too big and too diverse to see all in one trip. So, I have been back many times and not just for the art. I like the restaurants; I like the department stores; I like the theater. I saw four different Broadway plays last time I was there. I also went to Shea Stadium and saw the Mets play. They lost, but it was a great game. It was very crowded, and the subway ride going back to my hotel was very interesting although not very safe. I felt very overwhelmed by the crowded platforms. The people were pushing and shoving; I was afraid I would be hurt or at the very worst mugged and robbed. All in all, the good outweighs the bad. I'll go back to New York any time!

COLLEGE VISITATIONS
When visiting colleges, my parents and I traveled to five different schools, each in a different city, each a very different kind of school. We visited a very large school and we saw a very small school. We went to a big city, a small city, and a small town. We saw schools with huge libraries. Two had libraries that were almost all online. They had very few books or magazine collections at all; the magazines were all online which is a good thing because it makes it easier to read when doing research. The schools I liked best were the two smallest ones. They made my parents and me feel most welcome. I really liked the kids who took us around, and I know that fitting in wouldn't be a problem for me. Dress was a major similarity. I also realized that the weather was good at one because it was winter, and the snow was minimal. Naturally, that ruled out the University of Buffalo!

SUBJECT/VERB AGREEMENT

1. helps
2. has
3. has
4. were
5. has
6. has
7. was
8. has, is
9. has
10. were
11. thinks
12. fear, loves
13. plot
14. was
15. are
16. were
17. was
18. was
19. are
20. sells
21. is
22. reviews
23. graduates
24. remains
25. reports

PRONOUN ANTECEDENT AGREEMENT

1. he/she
2. his/her
3. his
4. he/she
5. we
6. his/her
7. his/her
8. his/her
9. he/she
10. his/her

WORDS COMMONLY CONFUSED

1. it's
2. principle, their
3. complemented
4. it's
5. too, patients
6. whether, it's
7. passed
8. to, dessert
9. effects
10. alter

COURAGE

By sentence:

1. Correct
2. Correct
3. Correct
4. lose his/her faith
5. the effects
6. Correct
7. Correct
8. Correct
9. Correct
10. Fused sentence. But this time was life threatening. Even his friends doubted his common sense.
11. Correct
12. Fused sentence. However, when they got him to shore he was unconscious. There were vital signs but they were weak; the paramedics pronounced him in great danger.
13. Correct
14. Correct

15. Fused sentence. Matt is 16 and Nan 13. She admires everything he does.

16. Comma splice and homonym error. She stayed at his bedside for three full days until he woke up. Christmas had already passed.

17. for Nan, too.

18. Comma splices. To this day everyone tries to figure out who was the real hero; who had the most courage; who learned the most.

19. Correct

20. Comma splices and homonym error. Matt never ice skated again. Nan kept him as her hero. Our family regained its faith.

C·H·A·P·T·E·R

READING COMPREHENSION

3

SUMMARY

Does this sound familiar to you? You've just read two whole pages of text and you can't remember a thing you've read. You read it again, this time determined to get it right. You stop midway; you start yet again. You give up and put the book away for later. Just like writer's block stops you from writing, drifting away while reading can be terribly frustrating, and it can derail an otherwise determined academic career. So why is it so difficult to read effectively? Is there anything you can do about it?

L et's start by defining effective reading. For most academic reading, whether it is a textbook (non-fiction), a novel or short story (fiction), or a piece of poetry, effective reading should mean that you can paraphrase, or put in your own words, what you have just read. You should also be able to:

- identify the main idea
- identify facts or details which support the main idea
- draw inferences
- interpret visual information
- identify vocabulary
- distinguish fact from opinion
- recognize an organizational pattern

"All that every time I read!" you say. The answer is yes. Absolutely. Undeniably. Completely. And if you sit down to read knowing that you have to accomplish as many as five or six of the above skills then you'll know that you can never sit down to read an assignment when you are tired, distracted, in a hurry, or otherwise likely to be interrupted. Reading, just like writing, requires patience and concentration. Most important, it requires specific strategies that you can learn to help make you a more effective reader.

MAIN IDEA

Let's start with the following non-fiction passage about crocodiles.

> A crocodile can grow to a length of 20 feet, weigh half a ton and tackle a 900-pound buffalo that wanders past at lunchtime. A crocodile can stay under water for $2\frac{1}{2}$ hours without a breath of air by slowing his heartbeat and going into semi-hibernation. He can outrun a man in a 100-yard dash, although there is no record here of any such footrace. A crocodile has 66 teeth that he tends to lose like mittens in the frantic pace of the hunt, so he grows up to 45 sets in a lifetime. For all those teeth, a crocodile can't chew. When a 900-pound buffalo strolls too near the riverbank, a crocodile snaps onto its leg and drags the buffalo under water, holding it there until it dies. Then the crocodile wedges the buffalo between some underwater roots and rips into its hide, swallowing whole chunks of the buffalo at a time. A crocodile needs two or three good feeds like this a month, although a naturalist for the Museum of Natural History reported that the crocodile he was studying went for an entire year without food until it starved to death.

1. What is the main idea of the passage?
   a. Crocodiles have multiple sets of teeth, but all of these teeth prove to be useless when killing prey.
   b. Crocodiles are extremely dangerous to their prey because they are so fast.
   c. Crocodiles are extremely powerful and can do serious damage to their prey.
   d. Despite common beliefs, crocodiles kill their prey by drowning not by chewing.

Before you leap to an answer, notice that main idea in reading comprehension is very much like theme in literature or thesis statement in your own writing. It refers not just to the topic *crocodiles,* but what the passage is saying *about* crocodiles. So, look at the four choices. Each of the choices is a correct statement from the passage. Choice **a** cites the fact that crocodiles have 45 sets of teeth in a lifetime. Choice **b** can be found in sentence three, which tells us that a crocodile can outrun a man. Choice **d** is also in the text. Only choice **c** draws a conclusion about crocodiles using information provided in the passage; crocodiles are big, strong, fast, and can kill a 900-pound buffalo in seconds by dragging him underwater! In other words, the main idea is not an isolated fact or detail from the passage. Instead, the main idea represents the way facts and details are used to support each other and represent the author's opinion or conclusion based on how the facts fit together.

2. Which of the following best sums up a crocodile's power?
   a. Crocodiles use buffalo as a natural source of prey.
   b. Crocodiles are no match for man.

c. Crocodiles are able to hibernate under-water.

d. Crocodiles combine their physical capabilities to dominate their prey.

Pause before you leap to answer, because like the main idea question above, all four answers are in the passage; however, only one *sums* up the other and that is choice **d**. Choices **a**, **b**, and **c** are all examples of the crocodile's strength and/or power. Only choice **d** combines them all.

3. Man has every reason to fear the crocodile because
   a. the crocodile has so many teeth.
   b. the crocodile treats a 900-pound buffalo like a rag doll.
   c. the crocodile can outrun him.
   d. the crocodile is bigger, stronger and more powerful than man.

Choice **d** is the only one that reflects the idea of the crocodile's power, which is the main idea of the passage. Notice that the big idea of the passage still dominates. You are always reading for the big idea.

This was a pretty basic passage. But it emphasizes a very important process that you must undertake every time you read, and that process is *making connections.* It's easy to use an orange highlighter to underline what you believe are important facts and details as you read. But how do all those important details fit together? What makes one fact more or less important than the other? Which fact will your teacher choose for the exam? If you can figure out the main idea, you can figure out how the facts, details, and data contribute to that idea. In turn, that will help you remember them and organize them. There are three basic ways to organize what you read.

- **Highlighting** is the first step in actively reading to identify main ideas and supporting details. However, the fact that you have highlighted every other sentence that you have read does not insure that you have thought through the connections interlocking what you've underlined.
- **Listing** (making a list) forces you to construct a simple hierarchy for the information you feel is important. So, after you've highlighted, it is wise to go back and create a list of the facts, details, and ideas that you highlighted on your first reading.
- **Outlining** forces you to complete the process of fully deconstructing text. A basic outline is nothing more than a series of lists onto which you have imposed a structure that shows the way information in a text is connected to the main idea. Simply stated, an outline is a visual diagram.

Look at the following passage. The bold text is what you might have highlighted.

BURNS
There are **three different kinds of burns:** first degree, second degree, and third degree. **Each type of burn requires a different type of medical treatment.**

The least serious burn is the **first degree burn which causes the skin to turn red but does not cause blistering.** A mild sunburn is a good example of a first degree burn, and like a mild sunburn, first degree burns generally **do not require medical treatment** other than a gentle **cooling of the burned skin with ice or cold tap water.**

Second degree burns, on the other hand, do **cause blistering** of the skin and should be treated immediately. These burns should be **immersed in warm water and then wrapped in a sterile dressing or bandage.** Do not apply butter or grease to these burns; despite the old wives' tale, butter does not help heal burns and actually increases the chances of infection. If second degree burns cover a large part of the body, then the **victim should be taken to the hospital immediately for medical care.**

Third degree burns are those that **char the skin and turn it black or burn so deeply that the skin shows white.** These burns usually result from direct contact with flames and have a great chance of becoming infected. **All third degree burn victims should receive immediate hospital care.** Burns should **not be immersed in water,** and **charred clothing should not be removed** from the victim as it may also remove skin. If possible, **a sterile dressing or bandage** should be applied to burns before the victim is transported to the hospital.

This short passage was very straightforward and relatively simple. Highlighting or listing might have been sufficient to help you remember the important details about the types of burns and the respective treatments for them.

However, a very simple outline for the passage might look like this, and it would provide a visual aid to help you remember what you read.

BURNS
I. Three kinds of burns
    A. First degree
        1. red skin with no blister
        2. apply cold water

    B. Second degree
        1. blistered skin
        2. immerse in warm water and bandage
        3. possible hospital treatment
    C. Third degree
        1. black, charred skin or white skin
        2. sterile dressing only
        3. immediate hospitalization

Notice how creating the outline makes the information so much easier to see and, consequentially, much easier to remember.

DRAWING INFERENCES

One of the most challenging tasks facing you as you read more and more complicated texts will be your ability to read between the lines and come to conclusions that are not necessarily spelled out in the print before you. *Explicit* means that the idea is spelled out in clear detail. You can find the exact word(s) or phrase(s) to support your answer. *Implicit,* on the other hand, means that the idea is not stated directly in the text. You have to *infer* the idea, attitude, opinion, and conclusion of the author. You may have heard this distinction referred to as *literal* and *interpretive.* When you read for literal information you read for exactly what the text says. When you read inferentially, or interpretively, you read for what the text implies.

Try this short passage.

In the summer, the northern hemisphere is slanted toward the sun, making the days longer and warmer than in the winter. The first day of summer, June 21, is called summer solstice and is also the longest day of the year. However, June 21 marks the beginning of winter in the southern hemisphere, when that hemisphere is tilted away from the sun.

1. According to the passage, when it is summer in the northern hemisphere, in the southern hemisphere it is
   a. spring.
   b. summer.
   c. autumn.
   d. winter.

Notice that the passage doesn't spell out that the seasons are opposite in the northern and southern hemispheres. You have to infer that relationship. Therefore, the answer is (**d**).

2. It can be inferred from the passage that, in the southern hemisphere, June 21st is the
   a. autumnal equinox.
   b. winter solstice.
   c. vernal equinox.
   d. summer solstice.

Notice that the answer to question 2 is not directly stated in the text itself. You have to *infer* that if June 21st is the summer solstice in the northern hemisphere that it will be the reverse or winter solstice in the southern hemisphere.

Now, try this passage.

When he returned from Vietnam as a disabled veteran, Roger Holmes was shocked at the anger and resentment that greeted him at the airport. Unlike the stories his father told him about returning to a grateful nation at the end of World War II, Roger felt he had returned to a country that scorned him. Both men shared a deep commitment to the ideals of democracy and freedom, and both men served in battle to protect those ideals. Now, only one would remain idealistic. Only one would be able to go through his life confident that his sacrifice on the battlefield had not been in vain. Neither man would ever again see military service in the same way.

3. In the above passage it can be inferred that
   a. Roger Holmes and his father became bitter about fighting for their country.
   b. Roger Holmes caused his father to question whether or not going to war was always a noble thing.
   c. Roger's father went to World War II because he had been drafted.
   d. Roger lost his legs stepping on a land mine.

Examine the choices carefully. Remember that you must *infer* the answer. It will not be spelled out in the text. If you chose answer **b**, you would be correct. Choice **a** goes beyond the scope of the text. There is no information in the passage to suggest that both men became bitter. As a matter of fact, sentences four and five single out only one man as having lost his idealism. Choices **c** and **d** also go beyond the scope of the text because there is no information about Roger's father being drafted and no information about the nature or extent of Roger's disability. But it can be inferred from the last sentence that Roger's father, like Roger, would be questioning the purpose of war.

Notice that drawing inferences is made easier if you have first determined the main idea and then attempted to organize the details that support the main idea. In this case the main idea is that perceptions about war vary for many reasons.

Now try applying your main idea and inference skills to a piece of literature (fiction). Some students find that reading literature is more difficult than reading for information because, by its very definition, literature is asking you to relate your own ideas and experiences to understanding the text. You have to always read for

more than the literal details to appreciate the attitudes and emotions conveyed in the writing.

As soon as she sat down on the airplane, Rachel almost began to regret telling the travel agent that she wanted an exotic and romantic vacation. As the plane hurled toward Rio de Janeiro, she read the information on Carnival that was in the pocket of the seat in front of hers. The very definition of Carnival made her shiver. It was from the Latin *carnavale*, meaning a farewell to the flesh. She was searching for excitement, but had no intention of bidding her skin good-bye. Carnival, the brochure informed her, originated in Europe in the Middle Ages and served as a break from the requirements of daily life and society. Most of all, it allowed the hard-working and desperately poor serfs the opportunity to ridicule their wealthy and normally humorless masters. Rachel, a middle manager in a computer firm, wasn't entirely sure whether she was more serf or master. Should she be making fun, or would others be mocking her? She was strangely relieved when the plane landed, as though her fate were decided. Rachel chewed on her lower lip as she stood before the mirror in her hotel room, choosing first one dress then another, trying to decide which outfit was the most serf-like. Nothing in her dress for success seminar had prepared her for this all-important decision. Finally, wearing her brightest blouse and skirt, she headed for the street, determined to find adventure.

1. The main idea of this passage is
   a. life in Rio de Janeiro
   b. a brief history of Carnival
   c. a traveler on an exciting vacation
   d. dress is an important decision at Carnival

2. Rachel was nervous on the airplane because she
   a. was afraid to fly.
   b. was taking a risk and trying something very new.
   c. forgot her traveler's checks and had no other money.
   d. was worried she would lose her luggage.

3. The passage implies that Rachel
   a. is traveling alone.
   b. takes a vacation every year.
   c. has never traveled abroad before.
   d. speaks Portugese.

4. According to the passage, Carnival
   a. lasts for several days.
   b. originated in Europe.
   c. occurs in February.
   d. is famous for good food.

5. Which of these sentences would most logically begin the next paragraph of this story?
   a. Settling herself comfortably at a table in the hotel coffee shop, Rachel began writing a postcard to her mother.
   b. Later that night, Rachel tossed in her bed, worried about the money she was spending.
   c. Rachel entered the huge office building and rode the elevator to the twelfth floor, the location of her 9:00 business meeting.
   d. As soon as she left the hotel, the sights and sounds of Carnival surrounded Rachel.

- For question 1 choice **c** captures the main idea. All the other choices are mentioned in the passage but are minor points.
- For question 2 choice **b** is implied in the first paragraph.
- For question 3 choice **a** is correct. We can infer that Rachel is traveling alone because no one else is mentioned. Any of the other choices could be true, but there is nothing in the passage to support them.
- For question 4 choice **b** is correct. Look at the first paragraph. The other choices happen to be true of Carnival, but they are not mentioned in the passage.
- For question 5 choice **d** is correct. The last line of the passage shows Rachel headed from her hotel room to the street where Carnival is taking place. Thus, a logical continuation is for Rachel to be experiencing the adventure she is determined to find.

INTERPRETING VISUAL INFORMATION

Visual information is just a fancy way of saying tables, graphs, and charts. Each of these is a way of organizing information so that it can be easily seen and identified. You'll find visual information in your daily reading. For example, if you want to know the weather conditions in any part of the globe, there's a table and map showing you the temperature the previous day, the current day, and the predicted temperature for the next day. If you are traveling, this information comes in quite handy because it helps you prepare the clothing you need to put in your suitcase. In fact, climatologists create many tables and charts as they work. Take a look at the table that follows.

FUJITA-PEARSON TORNADO INTENSITY SCALE

Classification	Wind Speed	Damage
F0	72 MPH	Mild
F1	73–112 MPH	Moderate
F2	113–157 MPH	Significant
F3	158–206 MPH	Severe
F4	207–260 MPH	Devastating
F5	260–319 MPH	Cataclysmic
F6	319–379 MPH	Overwhelming

Based on the Fujita-Pearson Tornado Intensity Scale, read and answer the questions that follow.

1. A tornado with a wind speed of 173 MPH would be assigned which classification?
   a. F0
   b. F1
   c. F2
   d. F3

2. The names of the categories in the third column, labeled "Damage," would best be described as
   a. scientific.
   b. descriptive.
   c. objective.
   d. whimsical.

ANSWERS

1. **d.** A wind speed of 173 mph falls between 158 and 206, which is the range for an F3 tornado; thus choice **d** is the correct choice.

2. **b.** Here you must use the inference skill we discussed earlier. Applying words such as mild, moderate, severe, devastating, and cataclysmic to the damage done by a tornado is a means of describing the damage; therefore the words are *descriptive*. Choice **b** is the correct choice.

Look at the chart below and respond to the questions.

BANK FAILURES IN THE UNITED STATES
FROM 1926 TO 1937

1926   X X X X

1931   X X X X X X X X

1933   X X X X X X X X X X X

1937   X

KEY: Each X represents 250 banks.

Answer the following questions as TRUE or FALSE.

_____ **1.** By 1937 banking regulations seem to have restored consumer confidence in the banking industry.

_____ **2.** There was no appreciable difference in the number of bank failures between 1926 and 1933.

_____ **3.** By 1937 the banking industry had reached the highest rate of stability it had shown since 1926.

_____ **4.** There were 500 more banks that failed in 1933 than failed in 1931.

ANSWERS

1. True

2. False

3. True

4. True

Not all tables, graphs, and charts are as simple as these two examples. However, one guideline that you should always follow when working with visuals is to examine the *key* or the *legend*. This gives you impor-

tant information about the size, number, and location of the information that will help you draw conclusions. In the graph above it was important for you to know that each X represented 250 banks.

VOCABULARY

You've heard the term *context clues* many times throughout your school years. And there is no doubt that searching for clues to the definition of unfamiliar words is especially important when you are trying to read and understand new subjects. Consider the following words:

> inundated
> alleviate
> relinquished
> meticulous
> incredulous

Can you provide a synonym? Can you explain the meaning? It's difficult when you see the word in isolation. See if the following sentences, which use the words in context, help you.

1. As soon as the details of the election were released to the media, the newspaper was *inundated* with calls—far too many to be handled effectively.
   a. provided
   b. bothered
   c. rewarded
   d. flooded

2. Since the townspeople were so dissatisfied, various methods to *alleviate* the situation were debated.
   a. ease
   b. tolerate
   c. clarify
   d. intensify

3. I *relinquished* my place in line to go back and talk with my friend Alex.
- **a.** defended
- **b.** yielded
- **c.** delayed
- **d.** remanded

4. The doctor was determined to find the cause of her patient's illness, no matter how well-disguised it might be, so her examination of Mrs. White was *meticulous.*
- **a.** delicate
- **b.** painstaking
- **c.** superficial
- **d.** objective

5. When people heard that Bob, who was afraid of heights, took up skydiving, they were *incredulous.*
- **a.** fearful
- **b.** outraged
- **c.** convinced
- **d.** disbelieving

You should have noticed that with careful examination of the word in the context of a complete sentence, you were able to derive a sense of its meaning. The answers for the above questions are:

1. d

2. a

3. b

4. b

5. d

However, to fully understand a word you must also use a dictionary. Context clues will help get you through a piece of reading without having to interrupt it everytime you come upon a new word. The dictionary, however, is the only place to give you a full definition with possible multiple meanings.

HINT: If you own the book you are reading, circle new words as you find them. Use context clues as your preliminary guide and then go back and use the dictionary for all the words you circled.

Apply context clues to new vocabulary words in the following excerpt from the short story "Paul's Case" by Willa Cather.

It was Paul's afternoon to appear before the faculty of the Pittsburgh High School to account for his various *misdemeanors.* He had been suspended a week ago, and his father had called at the Principal's office and confessed his *perplexity* about his son. Paul entered the faculty room suave and smiling. His clothes were a *trifle* outgrown, and the tan velvet on the collar of his open overcoat was *frayed* and worn; but for all that there was something of the *dandy* about him, and he wore . . . a red carnation in his buttonhole.

1. The word *misdemeanors* most likely means
- **a.** accomplishments.
- **b.** crimes.
- **c.** offenses.
- **d.** rewards.

2. The word *perplexity* most likely means
- **a.** innocence.
- **b.** confusion.
- **c.** anger.
- **d.** support.

3. The word *trifle* most likely means
- **a.** seriously.
- **b.** insignificantly.
- **c.** noticeably.
- **d.** terribly.

4. The word *frayed* most likely means
  a. ripped.
  b. faded.
  c. worn down.
  d. freshly cleaned.

5. The word *dandy* most likely means
  a. gentleman.
  b. soldier.
  c. teacher.
  d. scholar.

If you read the paragraph as a whole you should recognize that Paul is being suspended from Pittsburgh High School, and that *misdemeanors* are probably the *wrong deeds* or *offenses* that he has committed. His father confessed *perplexity* about his son. Because the author used the word *confessed* we can infer that Paul's father feels somewhat *guilty* about his son's behavior. It could also mean that the father is *confused,* is confessing that he didn't understand his son, and is guilty for not being more aware of his son's actions. That Paul's clothes were a *trifle* outgrown could mean *very* or *a little,* and the fact that his collar is *frayed* could mean almost anything from *dirty* to *torn.* However, the author goes on to describe Paul as a *dandy* with a red carnation in his buttonhole. So, if Paul is wearing a red carnation, it most likely means that he is trying hard to dress up a coat that is a little worn because of a torn collar, and he is trying to look like a fine gentleman or a *dandy*.

But you should go back and check the dictionary for words you do not know. You will find that many words have multiple meanings and that often words used in one time period have adopted new meanings in contemporary usage. The word *dandy*, for example, has more than one meaning, as does the word *trifle.* Try to view every encounter with a new word as an opportunity to develop your language skills.

ANSWERS

1. b

2. b

3. b

4. c

5. a

FACT AND OPINION

Simply stated, *facts* are what you know and *opinions* are what you believe. Commonly held beliefs, shared by many people, can be mistaken for facts, but facts must meet the *documentary evidence* test. It is the simple distinction that *facts* can be proven to be true, while *beliefs* cannot be proven to be true, which separates them. Your religious beliefs, for example, are opinions, not facts. Your faith in their truth may make you, personally, accept them as facts. But unless your beliefs can be scientifically proven, they cannot be *known* as facts. Let's look at the following sentences to see if you can distinguish fact from opinion.

1. The cafeteria serves lunch from 12–2.

2. The cafeteria's food is really delicious.

It should be pretty clear to you that (1) is a simple fact and (2) is clearly an opinion or belief.

Read these two sentences and decide whether they tell a fact or express an opinion.

1. College athletes earn one-tenth the money that professional athletes earn.

2. College athletes are underpaid.

The first sentence is a statement of fact. It can be substantiated and proven with data. On the other hand, sentence two is a statement of belief. It claims that col-

lege athletes are underpaid, and there are many who would disagree. Some would say that the value of tuition-free education, room and board, and the future earning capacity that a college education and athletic training provides more than compensates college athletes. But those same people cannot dispute that college athletes earn one-tenth the salary that professional athletes earn. All they can argue is that it isn't fair or equitable, and that argument immediately throws the statement into the realm of opinion or belief.

So one way to distinguish fact from opinion is to apply the debate test. If a statement can be debated it is opinion, not fact. Read these statements.

1. Carbon dioxide emissions produce unhealthy air.

2. The Environmental Protection Agency must enforce legislation to protect the air from increased carbon dioxide emissions.

Sentence one (1) is a claim of fact. It cannot be disputed that carbon dioxide emissions harm air quality. Scientific data eliminates all debates. But how we feel about that fact, and how we use that fact, is what takes it from fact to opinion, or belief. For example, sentence two (2) uses the fact that CO_2 is an air pollutant to suggest the need for government enforcement of air quality controls. Many Americans would disagree that such intervention is either needed or even constitutional. Notice, the disagreement is not about the *fact*, but about how the fact is used.

Next, decide whether the following statements are fact or opinion.

1. All Americans have the right to healthcare.

2. Congress has required the implementation of a new TV ratings system to aid parents in the selection of appropriate viewing for their children.

3. The new TV ratings system represents yet another unnecessary effort on the part of the government to reduce individual responsibility.

4. Affirmative action programs are morally correct for America.

5. Legalization of assisted suicide would benefit terminally ill patients by giving them more control of their own destiny.

You'll notice that these statements aren't quite as easy to work with as the first group of sentences. But you must remember the *debate* test and decide if the statement can be argued. Is it a fact or an opinion that all Americans have the right to health care? Well, about the only thing debatable in that statement is who should pay for the care? And how should it be provided? **Statement one is a fact**; where we go with it presents the debate.

Statement two is also a claim of fact. You may not agree with what Congress did, and you may even disagree with the whole concept of censoring what children watch on TV, but the statement simply says that Congress has legislated that there must be a system to do it.

Statement three is definitely a claim of opinion or belief. Whether or not the ratings system was necessary and whether or not the system will increase or decrease individual responsibility is highly debatable. But the fact remains; there is now a system of ratings.

Statement four is also a claim of opinion or belief. It isn't telling us whether or not there are affirmative action programs, which would be a claim of fact, but it is telling us that these programs are morally correct.

Statement five is a claim of fact. Legalizing assisted suicide would give the terminally ill more control. This is a highly charged claim of fact with lots of arguments

for why the terminally ill shouldn't have control. Nonetheless, it is a fact that such legislation would give them control.

How does knowing the difference between fact and opinion influence you as a reader? Well, what you read gains credibility when opinions are supported with facts and evidence. If you can discern the difference between fact and opinion then you can decide more easily to agree or disagree with the piece.

Consider these statements of fact. Rewrite them as statements of opinion or belief.

FACTS

1. School violence is rising in the United States.

_____

_____

_____

2. Anti-smoking laws have been enacted on all major airlines.

_____

_____

_____

3. The family farm is an endangered species in the United States.

_____

_____

_____

4. The United States has just lost its seat on the United Nations' Human Rights Commission.

_____

_____

_____

5. Research scientists tell us that we are only months away from producing the first human clone.

_____

_____

_____

STATEMENTS OF OPINION

These statements are suggested answers.

1. School violence is rising because handguns need to be restricted.

2. Anti-smoking laws on major airlines have restricted the constitutional rights of their passengers.

3. The family farm could be saved if Congress appropriated more funds.

4. The United States should not pay its dues to the United Nations until it gets its seat on the Human Rights Commission restored.

5. Human cloning should be pursued so that the first clone could appear in the year 2010.

Next, try reading an entire paragraph to determine where fact and opinion part company.

Underline the facts in this paragraph and highlight the opinions.

There are many different ways to invest your money to provide for a financially secure future. Many people invest in stocks and bonds, but I think good old-fashioned savings accounts and CDs (certificates of deposit) are the best way to invest your hard-earned money. Stocks and bonds are often risky, and it doesn't make sense to risk losing the money you've worked so hard for. True, regular savings accounts and CDs can't make you a millionaire overnight nor can they provide the high return that some stock investments do. But by the same token, savings accounts and CDs are fully insured and provide steady, secure interest on your money. That makes a whole lot of cents.

Being able to differentiate between fact and opinion is a very important skill, not only in reading but in listening as well. Knowing what people *think* as opposed to what they *know*, what they *believe* as opposed to what has *proven* to be true, empowers you to judge for yourself the validity of what you read and hear.

RECOGNIZING ORGANIZATIONAL PATTERNS

The way you write your thesis statement and the topic sentences for your paragraphs in an essay will determine the organizational pattern for either the whole essay or each paragraph. For example, if your thesis statement is that *school violence is rising in America,* then you have written a very general statement about school violence. Your reader can expect that you will be providing specific examples and details to support your claim. General to specific is one of the eight most typical organizational patterns that writers use. An entire list of all types of organizational patterns follows.

1. general to specific
2. specific to general
3. chronological/sequential
4. cause and effect
5. spatial
6. analysis/classification
7. order of importance
8. comparison and contrast

When you read, it helps to determine the writer's organizational pattern so that you can be prepared for the text that follows. For instance, it will alert you about taking notes and setting up an outline.

Let's take a close look at each of the organization patterns.

GENERAL TO SPECIFIC

Take the example of school violence from the claim of fact above. If this were written from **general to specific**, the general assertion that school violence is rising might look something like this:

School violence is rising in America. More and more news reports tell us that almost every day a school in America is reporting some kind of weapons violations concerning students. For example, last week in a small school district in Tennessee, a sixth grade boy held his principal hostage with a gun for almost eight hours. In Michigan, a tenth grader brought an assault rifle to a football game but was subdued before he could harm anyone. Yet the most alarming case was the massacre that took place at Columbine High School where two armed students killed several classmates and wounded many more. Weapons and schoolrooms just don't mix. Yet, as the incidents continue, so do the debates about just how to handle these crises.

Notice that the general introduction was supported by specific examples of violence before concluding with an invitation to explore *just how to handle the crises.*

SPECIFIC TO GENERAL

Another way to write that paragraph, from **specific to general**, might look like this:

An elementary school principal is held hostage by an unhappy sixth grader. A tenth grade boy brings an assault rifle to his high school football game. Two eleventh grade boys open fire and kill classmates and wound two teachers. Every day we hear the stories and are reminded that school violence is rising in America, and everywhere boards of education are trying to figure out what to do.

CHRONOLOGICAL/SEQUENTIAL

Yet another way, which would have emphasized the **chronological or sequential** order of events that led up to the rash of school violence, might be written like this:

First, schoolteachers were concerned with gum chewing as a major school offense. Then the language abuse started. Before long, students were dressing as if they had just gotten out of bed. Next, pushing and shoving became more common. Finally, weapons were used. At one time, teachers could discipline students to teach them codes of acceptable social conduct; now, teachers have all they can do to make sure that their students do not kill each other. School violence is rising in America, and it directly parallels the increase in the two-income family from 1950 to the present.

Notice that the words *first, next, then,* establish the sequence. Other transitional words for chronological/sequential writing would be *previously, simultaneously, following this, at this time, consequently, at this point, afterward,* etc. By noticing these transitional words, you can figure out the organizational pattern of a piece.

CAUSE AND EFFECT

Still another way to arrange the subject would be to present the rise in school violence as an effect of certain causes, and then it might have looked like this:

School violence in America is rising, and with it academic scores are falling. Could it be that America's school children are spending more time worrying about their safety than their algebra? Could it be that it has become harder to concentrate on reading when you're looking over your shoulder to see if the kid next to you really has a knife in his pocket? Experts say that declining math and reading scores are a direct consequence of school violence.

Note the use of the words *direct consequence.* Other words that establish **cause and effect** are *therefore, because, as a result, hence, then, since, so, consequently, thus*, etc.

SPATIAL

Yet another organization pattern arranges your ideas **spatially** from outside to inside—taking the reader from the big school entryway, to the classroom, to the individual student's desk.

To understand why school violence is rising in America all you have to do is enter the front door of any high school in America. Suburban, urban, rural, it doesn't matter. Once you move into the main hall you'll see the trophy case, a reminder of times when school spirit prevailed. The bell rings and you move into the hall. There is general chaos and lots of pushing and shoving. The stairwells are littered and the walls smeared with graffiti. It's hard to get up the stairs to the first class you've been asked to visit. Then you enter the first classroom, and the real surprises begin. You see that there are not many bulletin boards. Graffiti seems to mark the places where students once hung work. Chairs and desks are not in orderly rows. There is a hum of noise, and it seems clear that

no matter how hard the teacher is trying to gain attention, more students are not listening than the ones who are.

Words that indicate spatial reasoning include *beside, next to, around, below, in front of, near,* etc.

ANALYSIS/CLASSIFICATION

Still another common pattern orders your essay according to **analysis and classification** and would look like this:

There are three types of school violence issues in America today and each one is rising rapidly. First, there is the violent assault that is taking place against language. Students no longer respect the spoken or the written word and profanity rules. Second, there is a violent assault on social behavior. Students disrespect their administrators, their teachers, their classmates, and themselves. They answer back and ignore the common rules of courtesy. Finally, there is the violent assault in dress. Students dress for the beach, for a party, for a picnic or barbecue. They certainly don't dress for success. Violence against language, courtesy, and dress all contribute to the poor academic success rates of today's students.

Notice the words, *first, second, third*.

ORDER OF IMPORTANCE

Order of importance is often coupled with analysis/classification because it puts the items to be analyzed into a hierarchy of importance. So the passage above that was arranged for analysis would look like this:

There are three types of school violence issues in America today.

First, and most important, is the issue of language. There is a violent assault being perpetrated on our language. Students abuse it when they speak and when they write. Profanity prevails. In addition to their disrespect for language, students have begun to violate all the rules of common courtesy and decency that were once the hallmarks of a civilized society. And last, but not least, they are committing violence every time they dress in the morning. It is as if they are off to the beach or a picnic instead of the serious institution called school.

Notice that the biggest difference between *analysis/classification* and *order of importance* is that the latter establishes a pecking order for the issues to be addressed, i.e., *most important, least important, first, second*. Other words that give clues as to order of importance, are *more importantly, moreover, above all, last but not least,* etc.

COMPARISON AND CONTRAST

The final organization pattern is **comparison/contrast**, which does exactly what it says; it enables the writer to use similarities and differences between two things in order to present information. Here's how the school violence issue might look presented this way:

At the same time that violence is on the rise in America's public schools, there has been no appreciable rise in parochial schools. When the two school systems are put side by side, it is easy to see why. First, in public school the issue of dress creates an atmosphere for social disruption. On the other hand, uniforms in parochial school have long been known to establish order and respect. When students can come to school in dirty jeans and tee shirts

with obscenities written on them, it is no wonder that discipline is difficult. Contrast that to the parochial school student who knows, as he or she is getting dressed in the morning, that just as the dress for the day is restricted so will be the social conduct.

Words which signal comparison/contrast include *on the other hand, however, on the contrary, unlike, but, yet, nevertheless, rather, instead, whereas, although, in contrast,* etc.

It is important to note that a piece of reading can combine many organizational patterns. Order of importance and cause and effect, for example, often go hand in hand. When you read, it is important to pay attention to the organizational pattern. When you write, it is important to determine which pattern(s) will best serve your purpose as you set out to inform, persuade, or entertain your reader.

TEST YOUR SKILLS

READING COMPREHENSION PRACTICE PASSAGE

Now that you feel comfortable with different strategies and techniques by which authors write, use this new information to read the next paragraph and circle the correct response for the questions that follow. Notice that each sentence is numbered for easy reference.

TAXES

(1) There are many things you can do to make tax time easier. (2) The single most important strategy is to keep accurate records. (3) Keep all of your pay stubs, receipts, bank statements, and other relevant financial information in a neat, organized folder so that when you're

ready to prepare your form, all of your paperwork is in one place. (4) The second thing you can do is start early. (5) Get your tax forms from the post office as soon as they are available and then start calculating. (6) This way, if you run into any problems, you have plenty of time to straighten them out. (7) You can also save time by reading the directions carefully. (8) This will prevent time-consuming errors. (9) Finally, if your taxes are relatively simple (that is, you don't have itemized deductions or special investments), use the shorter tax form. (10) It's only one page, and if your records are in order, it can be completed in less than an hour.

1. The main idea of this passage is expressed in which sentence?
   a. 1
   b. 3
   c. 7
   d. 10

2. This paragraph uses which of the following organizational strategies?
   a. cause and effect
   b. analysis/classification
   c. order of importance
   d. chronology

3. Sentence (2) is a
   a. fact.
   b. opinion.
   c. both.
   d. neither.

4. Which of the following would be a good summary of this passage?
   a. Simple strategies can make tax time less taxing.
   b. Don't procrastinate at tax time.
   c. Always keep good records.
   d. Get a tax attorney.

5. Which of the following is the most effective underlining of the passage?
   a. You can also <u>save time</u> by reading the directions carefully. This will prevent time-consuming <u>errors</u>. Finally, <u>if your taxes are</u> <u>relatively simple</u> (you don't have itemized deductions or special investments), <u>use the shorter tax form</u>. It's only one page, and if <u>your records are in order</u>, it can be completed in less than an hour.
   b. You can also save time by <u>reading the directions carefully</u>. This will prevent time-consuming errors. Finally, if your taxes are relatively simple (<u>you don't have itemized deductions or special invest-ments</u>), use the shorter tax form. <u>It's only one page</u>, and it your records are in order, it can be completed in less than an hour.
   c. You can also save time by <u>reading the directions carefully</u>. This will prevent time-consuming errors. Finally, if your taxes are relatively simple (you don't have itemized deductions or special invest-ments), <u>use the shorter tax form</u>. It's only one page, and if your records are in order, it can be completed in less than an hour.

d. You can also <u>save time</u> by reading the directions carefully. This will prevent time-consuming errors. Finally, if your taxes are <u>relatively simple</u> (you don't have itemized deductions or special investments), use the shorter tax form. It's only one page, and if your records are in order, it can be completed in <u>less than an hour</u>.

ANSWERS

1. a

2. c

3. b

4. a

5. c

ESSENTIAL PRACTICE WITH MATH

4

SUMMARY

This chapter starts out with examples of the types of questions commonly found on college placement tests. In general, you will be evaluated on your knowledge and skills in the areas of arithmetic, elementary algebra, geometry, and measurement.

C ollege placement tests include these formats: pencil and paper tests, computer versions of these pencil and paper tests, and adaptive computer tests. (Adaptive computer tests adjust your test's difficulty level as you take it.) Your test may be timed, in which case you should expect it to be about half an hour long, but make sure you check all the particulars with your school in advance. Specifically, you should ask for the test format, time constraints, subject matter being assessed, and if you may bring a calculator. In fact, the best idea is to find out all of this information prior to reading this chapter. This way you will know which areas to study (and which ones to skip), and you will be practicing under simulative testing conditions.

With this done, read through the sample questions. These examples walk you through the common questions on a topic-by-topic basis. Then at the end of the chapter, you have a chance to assess your strengths and weaknesses with the Skill Builder questions. All of these questions have detailed explanatory answers and serve as another chance to brush up on

any skills you feel need work. If you have trouble with any of the Skill Builder questions, go back to the sample questions and make sure that you really understand the individual topics.

To recap, the game plan is: review (sample questions), practice and assess (Skill Builder), and go back (rereview topics as necessary). This is the best way to assure a solid foundation before attempting the sample test in the next chapter or the real test.

OPERATIONS WITH WHOLE NUMBERS

1. Janice has started a wholesale jewelry making business. She makes 36 bracelets a day, and sells them to local shops for $18.00 a dozen. How much does Janice make per week if she works 5 days a week?
   a. $220
   b. $270
   c. $54
   d. $378

2. At a baseball game, Deanna bought food for herself and her sister Jamie: 1 jumbo box of popcorn to share at $7 a box, 2 hot dogs for each of them (4 total) at $3 a dog, and one soda for each at $4 apiece. Jamie paid for their tickets at $13 a ticket. Who spent the most money and by how much?
   a. Deanna, by $1
   b. Deanna, by $3
   c. Jamie, by $2
   d. Jamie, by $4

OPERATIONS WITH FRACTIONS

3. Jack is retiling his kitchen floor. Each tile he has is $1\frac{1}{8}$ foot by $1\frac{3}{5}$ foot. What is the area of each tile?
   a. $\frac{3}{40}$ square feet
   b. $1\frac{3}{8}$ square feet
   c. $1\frac{4}{5}$ square feet
   d. $1\frac{3}{5}$ square feet

4. Divide $\frac{5}{9}$ by $\frac{5}{9}$.
   a. $\frac{9}{5}$
   b. 1
   c. $\frac{25}{81}$
   d. $1\frac{5}{9}$

OPERATIONS WITH DECIMALS

5. Lauren and Jenna want to buy a present for their mom, a bracelet that costs $50. Lauren has $5 from her allowance and $13.73 saved in her piggy bank. Jenna has $2.50 from her allowance, $7.19 in her piggy bank, plus she found $2 outside. If their dad gives them $10 towards the gift, how much more money do they need?
   a. $30.42
   b. $19.58
   c. $40.42
   d. $ 9.58

6. Zoey needs to build a deck in her backyard that is 12.84 feet by 14.3 feet. How many square feet will the deck be?
   a. 233.89 square feet
   b. 1,836.12 square feet
   c. 183.612 square feet
   d. 183,612 square feet

RATIO AND PROPORTION

7. If it takes 27 nails to build 3 boxes, how many nails will it take to build 7 boxes?
   a. 64
   b. 72
   c. 56
   d. 63

8. In Mrs. Sam's first grade class, the ratio of boys to girls is 3 to 4. There are 28 students total. How many are girls?
   a. 12
   b. 20
   c. 16
   d. 4

PERCENTS

9. Change 35% into a decimal.
   a. 3.5
   b. .35
   c. 35.0
   d. .035

10. 75 people were invited to the Frazzettas' wedding. All but 9 were able to attend. What percent couldn't come?
   a. 8.33%
   b. 7.5%
   c. 12%
   d. 9%

ABSOLUTE VALUE

11. What is $|47 - 64|$?
   a. 17
   b. -17
   c. 111
   d. 47

12. Find $|-\frac{2}{3}|$.
   a. $-\frac{2}{3}$
   b. $\frac{3}{2}$
   c. $1\frac{1}{2}$
   d. $\frac{2}{3}$

EXPONENTS

13. Calculate $43^2 \times 4$.
   a. 172
   b. 129
   c. 7,396
   d. 1,849

14. Calculate $(-\frac{1}{5})^3$.
   a. $\frac{1}{125}$
   b. $\frac{1}{5}$
   c. $-\frac{1}{125}$
   d. $-\frac{3}{15}$

SCIENTIFIC NOTATION

15. What is the correct way to write 3,600,000 in scientific notation?
   a. $3,600 \times 100$
   b. 3.6×10^6
   c. 3.6×10^{-6}
   d. 36×10^6

16. 7.359 multiplied by 10^{-6} is equal to
   a. 0.0007359
   b. 0.00007359
   c. 0.000007359
   d. 0.0000007359

SQUARE ROOTS

17. Which of the following equations is correct?
   a. $\sqrt{36} + \sqrt{64} = \sqrt{100}$
   b. $\sqrt{25} + \sqrt{16} = \sqrt{41}$
   c. $\sqrt{9} + \sqrt{25} = \sqrt{64}$
   d. There is no correct equation.

18. What is another way to write $5\sqrt{12}$?
   a. $12\sqrt{5}$
   b. $10\sqrt{3}$
   c. $6\sqrt{3}$
   d. 12

CALCULATING MEAN, MEDIAN, AND MODE

For questions 19 and 20, memorize these definitions:

Mean: When you are calculating the mean of a series of numbers, you are simply finding the average.

Median: The median is the number in the middle of a series. If there are two middle numbers in a set, the median is the average of the two.

Mode: The mode is the number that appears most frequently in a series.

19. Calculate the mean of the following test scores: 92, 89, 96, 93, 93, and 83.
   a. 93
   b. 91
   c. 92.5
   d. 91.5

20. Find the mode of the following series of numbers: 2 3 7 7 9 9 9 9 14
   a. 2
   b. 7
   c. 9
   d. 14

GEOMETRY

Measurement

1. What is the area of the shaded region in the figure below?
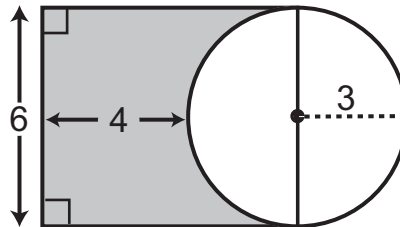
   a. $42 - 4.5\pi$
   b. $42 - 9\pi$
   c. 24
   d. 42

This question requires the knowledge of 2 area formulas:

- Area of rectangle = length × width
- Area of circle = πr^2

This question also requires some reasoning. Exactly how much of the whole figure is shaded? How can you use these area formulas to help? Well, you might've noticed that the shaded region is just the area of the rectangle minus the area of $\frac{1}{2}$ the circle. You can write a formula for yourself:

Area shaded = Area of Rectangle $- \frac{1}{2}$ Area of Circle

Let's get all the pieces we need by marking up the figure a different way:
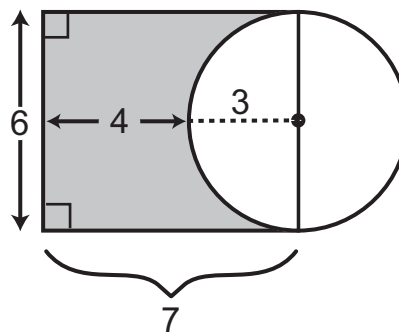
Notice that by drawing a new radius, we know that the length of the rectangle is 7. We already knew that the width was 6, so the area of the rectangle is just length × width = 7 × 6 = 42.

Now, we will figure out the area of the circle using $A = \pi r^2$, which becomes $\pi(3)^2 = 9\pi$. If the area of the whole circle is 9π, then the area of half the circle will be $\frac{1}{2} \times 9\pi = 4.5\pi$.

Thus, the area of the shaded region is

$$\text{Area shaded} = \text{Area of Rectangle} - \tfrac{1}{2}\,\text{Area of Circle}$$

$$\text{Area shaded} = 42 - 4.5\pi$$

The correct answer is **a**.

2. Using the formula $V = \frac{1}{3}\pi r^2 h$, what is the volume of the cone below?
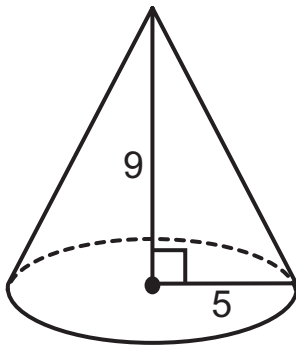
a. $\frac{45}{3}\pi$
b. 45π
c. 75π
d. 125π

Looking at the figure, we see that the radius, r, is 5 and the height, h, is 9. We plug the values $r = 5$ and $h = 9$ into the volume formula $V = \frac{1}{3}\pi r^2 h$. The formula becomes $V = \frac{1}{3}\pi(5)^2(9) = V = \frac{1}{3}\pi(25)(9)$. At this point, you may be inclined to multiply 25 by 9. But remember what we told you in the beginning of the book about questions working out nicely? Does it seem nice to multiply 25 by 9 and then take a third of that number? No. How about this: Take $\frac{1}{3}$ of the 9 instead.

$$V = \tfrac{1}{3}(9)\pi(25) = 3\pi(25) = 75\pi$$

Thus, the answer is **c**.

Quadrilaterals

1. What is the area of the trapezoid shown below?
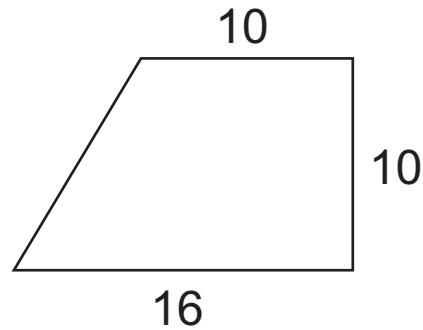
a. 260
b. 210
c. 160
d. 130

The area of a trapezoid is $A = \frac{1}{2}(\text{base}_1 + \text{base}_2) \times \text{height}$. In this case, the formula becomes $A = \frac{1}{2}(10 + 16) \times 10 = \frac{1}{2}(26) \times 10 = 13 \times 10 = 130$. Thus, choice **d** is correct.

2. What is the area of the parallelogram shown below?
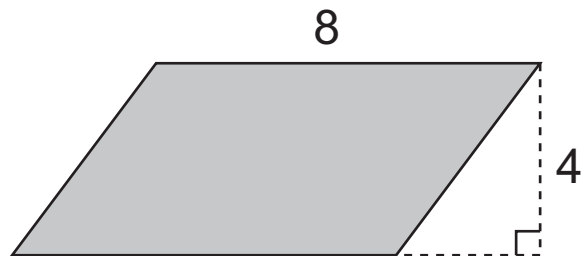
a. 64
b. 32
c. 16
d. It cannot be determined by the information given.

The area of a parallelogram is $A =$ base $\times$ height. Looking at the diagram, we see that the base is 8 and the height is 4. The area, $A = 8 \times 4 = 32$. Thus, choice **b** is correct.

Triangles

1. In the right triangle below, $\overline{AB} = 4$ and $\overline{AC} = 5$. What is the value of $\overline{BC}$?
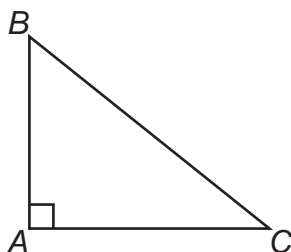
    a.   3
    b.   between 6 and 7
    c.   7
    d.   between 7 and 8

To solve this question, we will use the Pythagorean theorem, $a^2 + b^2 = c^2$, where a and b represent 2 legs of the right triangle, and c represents the *hypotenuse* of the right triangle. The *hypotenuse* is the longest side of a right triangle and it is always opposite the 90° angle (the right angle). Let's fill in the information that we know:

$$a^2 + b^2 = c^2$$

$$(4)^2 + (5)^2 = c^2$$

$$16 + 25 = c^2$$

$$41 = c^2$$

$$c = \sqrt{41}$$

Because we know $6^2 = 36$ and $7^2 = 49$, we know that $\sqrt{41}$ will be between 6 and 7, choice **b**.

2. In the figure shown below, what is the value of x?
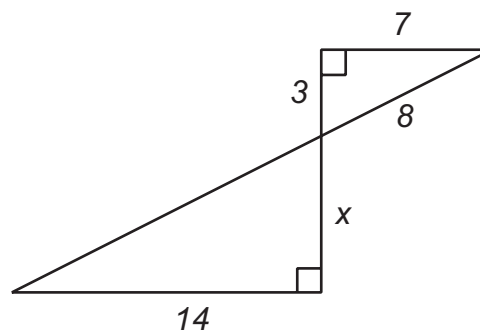
    a.   16
    b.   13
    c.   9
    d.   6

The figure is comprised of 2 triangles. These triangles happen to be similar triangles. Triangles are *similar* when they have all three angles in common. The sides of similar triangles are in proportion.

We know that these 2 triangles are similar because they both have right angles, and the angles marked below are equal as well.
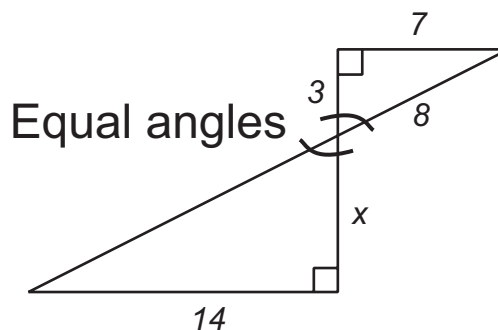
It follows that the third angles must also be equal because all triangles have 180°. (90° + marked angle + 3rd angle = 180° for both triangles.)

In order to figure out the proportion, you just look at the sides opposite the equal angles.
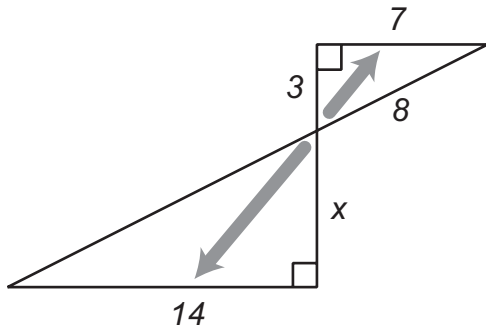
The top triangle has a side of 7, and the bottom triangle has a side of 14, so we know that *the sides of the bottom triangle are double the sides of the top triangle.*

Since x is opposite the 3rd angle, we look at the top triangle to see that 3 is opposite the 3rd angle. We double the 3 to get $x = 6$. Thus, the answer is **d.**

Parallel Lines

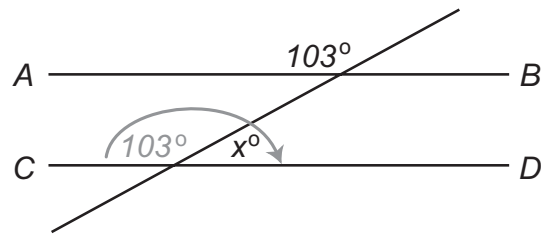**1.** If $\overline{AB}$ is parallel to $\overline{CD}$, what is the value of x?
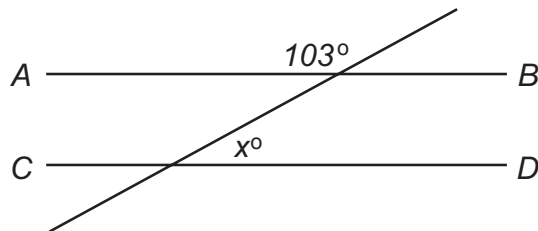
a. 77°
b. 87°
c. 103°
d. 113°

We know that $\overline{AB}$ and $\overline{CD}$ are parallel, so any line that intersects them will create the same angles as it crosses each line. Notice how we can write 103° in the figure below:
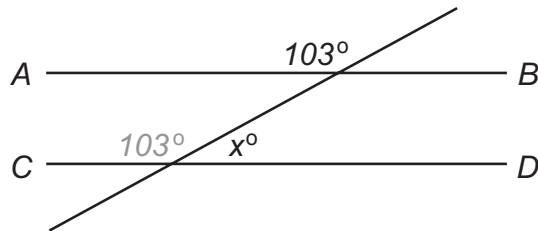
Also, we know that $103° + x = 180°$, because there are 180° in a straight line:

We can solve for x by subtracting 103° from both sides of the equation $103° + x = 180°$. Thus, $x = 77°$, which is choice **a.**

2. Given that $\overline{lm}$ and $\overline{no}$ are parallel, use the figure below to determine the value of $a + b + c + d$.
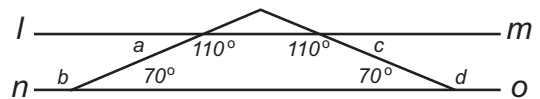
a. 120°
b. 180°
c. 270°
d. 360°

Just by knowing that straight lines are 180°, we can fill in all the values for a, b, c, and d:
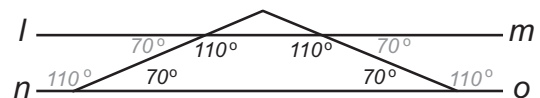
Now we just add up the values: $a + b + c + d = 70° + 110° + 70° + 110° = 360°$, choice **d.**

Coordinate Geometry

1. Which line below has no slope?
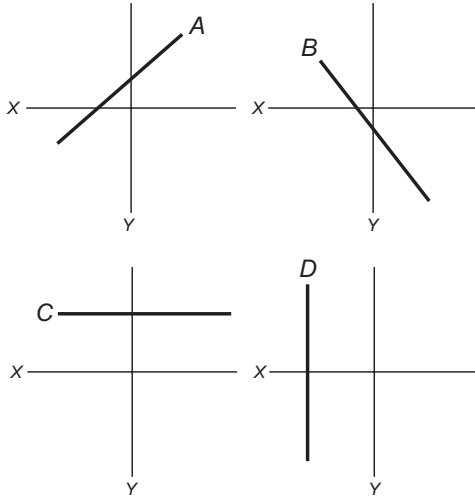
   a. Line *A*
   b. Line *B*
   c. Line *C*
   d. Line *D*

Let's review how to tell the slope of a line by looking at each graph:

*positive slope*   *negative slope*
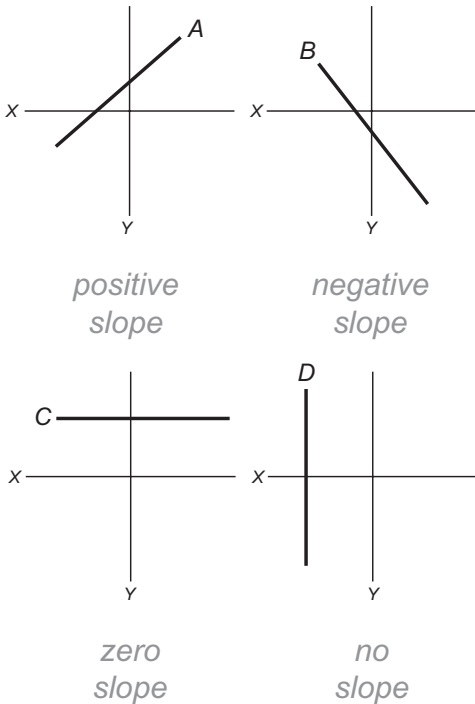
zero slope   *no slope*

Thus, choice **d** is correct. This line has no slope because

$$\text{slope} = \frac{\text{change in } y}{\text{change in } x}$$

There is no change in *x* for Line D. No change = zero, which means we would have a zero in the denominator of our slope formula. Zeroes and denominators do not mix! (Actually dividing by zero is technically termed *undefined*, as in you can't do it!) Therefore, there is *no slope*!

Line C is interesting to look at as well. Here there is a *zero slope* because there is a zero in the numerator of the slope formula. There is a zero in the numerator of the slope formula because there is no change in y.

2. Line $\overline{AB}$ below contains the points $(2, 3)$ and $(-3, -2)$. What is the equation of line AB?
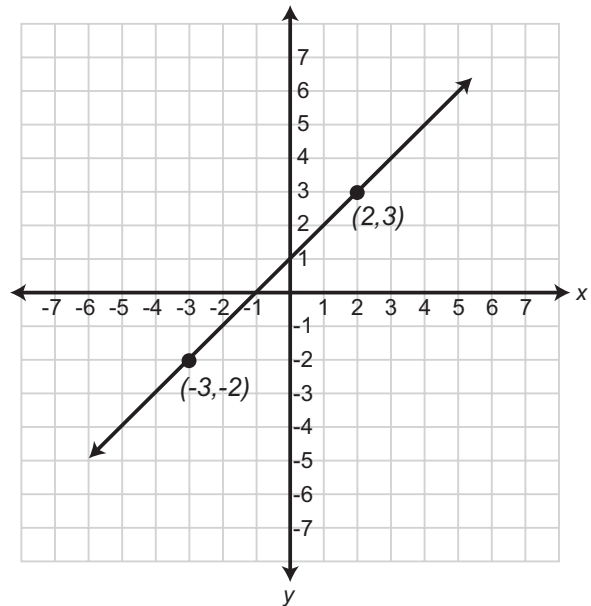
   a. $y = x - 1$
   b. $y = -3x + 2$
   c. $y = x + 1$
   d. $y = 2x + 3$

The equation of a line is $y = mx + b$, where *m* is the slope of the line $\left(\frac{\Delta y}{\Delta x}\right)$ and *b* is the *y* intercept. We are given 2 points to work with, so first we will determine the slope.

$$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{3 - -2}{2 - -3}$$

$$= \frac{3 + 2}{2 + 3}$$

$$= 1$$

Putting $m = 1$ into the equation $y = mx + b$, we get $y = x + b$. We can use one (x, y) pair to figure out what b is. Let's use the point $(2, 3)$ and stick them into the equation below:

$$y = x + b$$

$$3 = 2 + b$$

$$b = 1$$

So, our final equation is $y = x + 1$, choice **c**.

ALGEBRA

Substitution

1. If $b = -2$, what is the value of $b^2 - b + 10$?

    a. 4

    b. 12

    c. 16

    d. 18

This question tells you that b equals -2, so all you have to do is stick a -2 in for b in the equation $b^2 - b + 10$. The equation then becomes $(-2)^2 - (-2) + 10$, which equals $4 - (-2) + 10$, which is the same as $4 + 2 + 10$. Thus, the answer is **c**, 16.

2. If $a = 5, b = -1$, and $c = 6$, what is the value of $\frac{ac + b}{b}$?

    a. -31

    b. -29

    c. 29

    d. 31

Since we are told that $a = 5, b = -1$, and $c = 6$, we will put these values into the equation $\frac{ac + b}{b}$

The equation becomes $\frac{(5)(6) + (-1)}{-1} = \frac{30 - 1}{-1} = \frac{29}{-1}$
$= -29$

Thus, the answer is **b**.

English to Equation

1. Joe only owns 12 more than half the amount of CDs stacked on his dresser, and the rest were borrowed from a friend. If there are a total of 52 CDs in the stack, which equation represents the amount of CDs that he borrowed, B?

    a. $B = 12 + (\frac{1}{2} \times 52)$

    b. $B = 52 - 12$

    c. $B = \frac{1}{2} \times 52 - 12$

   **d.** $B = 52 - (12 + \frac{1}{2} \times 52)$

First, realize that there are 52 CDs total, and that some are Joe's and some are the ones he borrowed. So the basic idea would be: **52 total CDs = # Joe's + # Joe borrowed.** We know we should call the borrowed CDs B, and if we similarly call the number of Joe's CDs J, we know **52 = J + B.** Because we know that we need to find B, we will rearrange this equation by subtracting J from both sides:

$$
\begin{array}{rcl}
52 & = & J + B \\
-J & & -J \\
\hline
52 - J & = & B
\end{array}
$$

Hence, we know that $B = 52 - J$. But none of the answers have a J! This means we need to be more specific about J. What do we know about J, or the number of CDs that Joe owns? Well, the question states that: "*Joe only owns 12 more than half the amount of CDs stacked on his dresser.*" We need to express this statement mathematically. If Joe owns 12 more than half the amount total, and we know that the total is 52, then he owns 12 more than $\frac{1}{2}$ of 52. ***More than*** means ***plus***, and ***of*** means ***multiply***. Mathematically, we know ***$J = 12 +$***

$\frac{1}{2} \times 52$. We now write $12 + \frac{1}{2} \times 52$ in place of *J* in the equation *B = 52 − J*.

B	=	$52 - J$
B	=	$52 - (12 + \frac{1}{2} \times 52)$
borrowed	=	total − Joe's
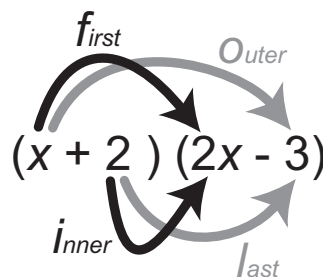
So, the answer is **d.**

2. Which answer choice mathematically expresses the product of 2 more than *x* and 3 less than twice *x*?
   a. $3x^2 + 7x + 6$
   b. $3x^2 - 7x - 6$
   c. $3x^2 + x - 6$
   d. $3x^2 + x + 6$

We are asked to find the *product* so we know that we will be multiplying. What exactly are we multiplying? Well, one of the quantities given is "2 more than *x*," which is just $(x + 2)$. The second quantity given is "3 less than twice *x*," which can be expressed mathematically as $(2x - 3)$. When we multiply $(x + 2)$ by $(2x - 3)$, we get:

$$(x + 2)(2x - 3)$$

This would be a perfectly good answer except for one problem: It is not one of your choices! So after muttering comments about the test question under your breath, you'll realize that you need to *expand* your current expression. We expand out $(x + 2)(2x - 3)$ by using FOIL. FOIL is just an acronym for FIRST, OUTER, INNER, and LAST. It describes the order in which you multiply your two sets of parentheses:

$(x + 2)(2x - 3) = 2x^2 - 3x + 4x - 6$. This simplifies to $2x^2 + x - 6$, which is choice **c.**

Solve for *x*

1. Given $7x + 2 = 5x + 14$, what is the value of *x*?
   a. 4
   b. 6
   c. 8
   d. 10

The first thing you want to do is isolate your variable. This means you want to combine your *x* terms on one side of the equation, and your numbers on the other side of the equation. Below we will subtract $5x$ from both sides in order to combine *x* terms:

$$\begin{array}{rcl} 7x + 2 & = & 5x + 14 \\ -5x & & -5x \\ \hline 2x + 2 & = & 14 \end{array}$$

Now we will subtract 2 from both sides in order to isolate the *x* term.

$$\begin{array}{rcl} 2x + 2 & = & 14 \\ -2 & & -2 \\ \hline 2x & = & 12 \end{array}$$

Finally, divide both sides by 2 to get *x* =6, or choice **b.**

Inequalities

1. Which inequality below is equivalent to $3x + 12 > 24$?
   a. $x > 4$
   b. $x < 4$
   c. $x > 12$
   d. $x < 12$

This type of question is a lot like the "Solve for x" questions that we did above. The goal here is to isolate your x. First we will subtract 12 from both sides:

$$
\begin{array}{rcl}
3x + 12 & > & 24 \\
-12 & & -12 \\
\hline
3x & > & 12
\end{array}
$$

Now we will divide both sides by 3 to get $x > 4$, which is choice **a**.

2. $-5x + 3 > 28$ can also be expressed as
   a. $x < -\frac{31}{5}$
   b. $x > -\frac{31}{5}$
   c. $x > -5$
   d. $x < -5$

Again, we need to isolate our x. First we will subtract 3 from both sides.

$$
\begin{array}{rcl}
-5x + 3 & > & 28 \\
-3 & & -3 \\
\hline
-5x & > & 25
\end{array}
$$

Now there is one rule that you need to remember when dealing with inequalities: When you multiply or divide by a negative number you need to reverse the sign. So when we divide by -5, we get

$$\frac{-5x}{-5} > \frac{25}{-5}$$

$x < -5$, which is choice **d**.

Simplifying Equations

1. $3(5x - 2) - (x - 1) =$
   a. $16x + 7$
   b. $14x - 5$
   c. $14x + 5$
   d. $16x - 7$

First we will distribute the 3 inside the parentheses. This means we do 3 times $5x$ and then minus 3 times 2.

$$3(5x - 2\,) - (x - 1)$$

Thus, the original equation $3(5x - 2) - (x - 1)$ becomes $15x - 6 - (x - 1)$. This is the same as $15x - 6 - 1(x - 1)$. It is important to insert the one there (mentally or physically) because we will be distributing $a -1$ inside the remaining parentheses.

$$15x - 6 - 1(x - 1)$$

The equation becomes $15x - 6 - x + 1$. Combining like terms, we get $14x - 5$, choice **b**.

2. If x is not equal to ± 3, then $\frac{x^2 - x - 6}{x^2 - 9}$ is equivalent to:
   a. $\frac{x + 2}{x - 3}$
   b. $\frac{x + 2}{x + 3}$
   c. $\frac{x - 2}{x - 3}$
   d. $\frac{x - 2}{x + 3}$

First, let's take a look at the top part of the given expression. $x^2 - x - 6$ can be factored into two sets of parentheses:

$$(x \pm ?)(x \pm ?)$$

Looks almost like a FOIL question, doesn't it? That is because we are in essence doing a reverse FOIL here. Next, look at the coefficient of the x term:

$$x^2 - 1x - 6$$

Note that the coefficient is *negative one*. (Sure, the original question didn't have a -1 there, but $-x$ is the same as $-1x$, isn't it?) Because there is no coefficient for the x^2 term, the -1 coefficient of the x terms tells us the sum of the two numbers that are going to get stuck in parentheses will be -1. So, so far we know we are looking for two numbers that add to -1. Then, we look at the lone number, or the last term, the -6. The -6 represents the product of the two numbers that we will be sticking in our parentheses. So, we need two numbers that add to -1 and multiply to -6. Think about it a bit. What numbers work? Did you come up with -3 and 2? Let's put these numbers inside the parentheses:

$$(x - 3)(x + 2)$$

What is the last thing you want to do right now? The whole process all over again? Well, guess what we have to do? We have to do the whole process all over again for the bottom part of the expression, so let's take a look at $x^2 - 9$ and set up our parentheses:

$$(x \pm \,?)(x \pm \,?)$$

But we're lucky because there is no x term in the bottom part of the expression (the x term would be $0x$). This means our two missing numbers add to 0 and because the lone number is -9, they multiply to -9. So our numbers are $+3$ and -3, and the bottom part of the expression is:

$$(x - 3)(x + 3)$$

So let's put the top on top of the bottom and get this over with:

$$\frac{(x - 3)(x + 2)}{(x - 3)(x + 3)}$$

Notice how you can cancel out an $(x - 3)$ on top with an $(x - 3)$ on the bottom, leaving us with:

$$\frac{(x + 2)}{(x + 3)}$$

Familiarize yourself with the layout of this type of question. Notice how all the answer choices are in the form:

$$\frac{(x \pm \,?)}{(x \pm \,?)}$$

This will help you enormously, because instead of scratching your head trying to figure out your pairs of numbers, you are given some clues. In this case you know that one of your top numbers is ± 2, and one of your bottom numbers is ± 3. Thus, **b** is the correct answer.

Quadratic Equations

1. What are the solutions to $x^2 + 6x - 16 = 0$?
   a. $x = -2, -8$
   b. $x = 2, -8$
   c. $x = -2, 8$
   d. $x = 2, 8$

The expression $x^2 + 6x - 16 = 0$ can be factored into two sets of parentheses:

$$(x \pm \,?)(x \pm \,?) = 0$$

Because the coefficient of the x^2 term is 1, we know that the sum of the two missing numbers is 6 (the coefficient of the x term) and the product of the two missing numbers is -16 (the lone number). The two numbers that satisfy these conditions are -2 and 8. We fill in our parentheses:

$$(x - 2\,)(\,x + 8\,) = 0$$

We have two quantities that, when multiplied, yield zero as the answer. Simply put, we have:

$$something \times something = 0$$

If the answer is zero, then we know that one of those quantities (one of those *somethings*) has to be zero. So we set both of those *somethings* equal to 0.

$$(x - 2)(x + 8) = 0$$

$$\begin{array}{c|c} x - 2 = 0 & x + 8 = 0 \\ x = 2 & x = -8 \end{array}$$

Thus, the answer is **b**.

2. If x is a positive number, and $x^2 - 8x + 9 = 0$, what is the value of x?
  a. -1
  b. 9
  c. all of the above
  d. none of the above

The expression $x^2 - 8x + 9 = 0$ can be factored into two sets of parentheses:

$$(x \pm ?)(x \pm ?) = 0$$

Again, because the coefficient of the x^2 term is 1, we know that the sum of the two missing numbers is -8 (the coefficient of the x term) and the product of the two missing numbers is 9 (the lone number). The two numbers that satisfy these conditions are -9 and 1. We fill in our parentheses and set each set of parentheses equal to 0:

$$(x - 9)(x + 1) = 0$$
$$x - 9 = 0 \mid x + 1 = 0$$
$$x = 9 \mid x = -1$$

But be careful! The question told us that x is positive! This means that only 9 is correct, choice **b**.

SKILL BUILDER QUESTIONS

1. John has a box containing 84 nails, and he finds 47 around his workshop. If his current project requires four times the amount he already has, how many more nails does he have to buy?
  a. 131
  b. 524
  c. 393
  d. 84

2. How much is one-eighth of one-sixth?
  a. $\frac{1}{48}$
  b. $\frac{6}{8}$
  c. $\frac{1}{12}$
  d. $\frac{1}{6}$

3. For every dollar Zelda saves, her dad contributes a dime to her savings. If Zelda saves $10 in June, $25 in July and $13 in August, how much will she have in savings at the end of that time?
  a. $52.80
  b. $52.00
  c. $53.80
  d. $48.00

4. Jessica is having a party and is making a sparkling drink. Her recipe calls for 1 part fruit punch and 2 parts Sprite. If she adds 3 cups of fruit punch, how much Sprite would she need?
  a. 2 cups
  b. 6 cups
  c. 3 cups
  d. 4 cups

5. Change 42% to a fraction.
  a. $\frac{1}{42}$
  b. $\frac{1}{4.2}$
  c. $\frac{21}{50}$
  d. $\frac{4.2}{100}$

6. Calculate $|\frac{3}{4} \div \frac{1}{5}|$.
  - **a.** $\frac{3}{20}$
  - **b.** $3\frac{3}{4}$
  - **c.** $\frac{4}{15}$
  - **d.** $-3\frac{3}{4}$

7. What is $-11^3 + 4^2$?
  - **a.** -1315
  - **b.** 1347
  - **c.** 1315
  - **d.** -1347

8. What is 4.0×10^4 multiplied by 3000?
  - **a.** 12×10^8
  - **b.** 1.2×10^4
  - **c.** 1200×10^4
  - **d.** 1.2×10^8

9. What is $\sqrt{64} + \sqrt{36}$ equal to?
  - **a.** 100
  - **b.** 10
  - **c.** 14
  - **d.** 64

10. What is the mode of the following series of numbers: $\sqrt{3}$ $\sqrt{3}$ $\sqrt{3}$ $\sqrt{3}$ 4 6 $\sqrt{8}$ 9
  - **a.** 9
  - **b.** 4
  - **c.** $\sqrt{3}$
  - **d.** $\sqrt{8}$

11. If Brian can run around the block four times in 20 minutes, and Jaclyn can run around the block three times in 12 minutes, who can make it around the block more times in an hour, and by what amount?
  - **a.** Brian, three times more
  - **b.** Jaclyn, three times more
  - **c.** They both go around 12 times
  - **d.** Brian, eight times more

12. Mary has read $\frac{2}{5}$ of a book assigned for her college class. The book is 255 pages long. How many pages has she read?
  - **a.** 200
  - **b.** 102
  - **c.** 153
  - **d.** 100

13. Ellen is a traveling saleswoman. She drove 373.5 miles on Monday, 481.6 miles on Tuesday, 392.8 miles on Wednesday, 502 miles on Thursday, and 53.7 miles on Friday. What was the total distance she drove?
  - **a.** 1351.8 miles
  - **b.** 1803.6 miles
  - **c.** 1813.6 miles
  - **d.** 2286.9 miles

14. If Jack always spends $18 on gaming equipment in a week, how much does he spend in 6 weeks?
  - **a.** $60
  - **b.** $48
  - **c.** $108
  - **d.** $180

15. Change $12\frac{1}{2}\%$ to a fraction.
  - **a.** $\frac{1}{8}$
  - **b.** $\frac{1}{12.5}$
  - **c.** $\frac{12}{100}$
  - **d.** $\frac{25}{1}$

16. Amber needs to find the absolute value of -123.456 for her exam. What is the correct answer?
  - **a.** 123.456
  - **b.** -123.456
  - **c.** 654.321
  - **d.** 1.2×10^{-3}

17. Find the value of -12^2.

   a. 144

   b. -144

   c. 24

   d. -24

18. What is another way to write 3.0×10^{12}?

   a. 3 billion

   b. 3 trillion

   c. 3 million

   d. 300,000

19. What is the square root of 121?

   a. 242

   b. 12

   c. 11

   d. 14,641

20. Joe worked 3 months during the summer, earning $522.75 during the first month, $498.25 in the second month and $530 in the third month. Calculate the mean of his paychecks.

   a. $517

   b. $522.75

   c. $1551

   d. $530

21. Jane is a waitress. She made $153 on Friday, $167 on Saturday, and $103 on Sunday; then she spent $94 on Monday, and $19 on Tuesday. How much did she have left?

   a. $133

   b. $423

   c. $94

   d. $310

22. Jesse ate $\frac{1}{2}$ of a pizza and left the other half in his dorm room. Dennis came by and ate one-quarter of what was left there. How much of the original pie did Dennis eat?

   a. $\frac{1}{16}$

   b. $\frac{1}{6}$

   c. $\frac{1}{4}$

   d. $\frac{1}{8}$

23. At the Fabric Barn, flowered material sells for $3.95 per yard. If Missy buys 13.5 yards, which amount is closest to what she will spend?

   a. $38

   b. $85

   c. $52

   d. $522

24. Teresa and Jan need to buy cups for their new hotel-restaurant in New Hampshire. At Ed's Discount Diningware, 50 cups cost $75. At that price, how much would 200 cups cost?

   a. $300

   b. $200

   c. $225

   d. $150

25. Change the fraction $\frac{3}{8}$ into a percent.

   a. 2.67%

   b. 38%

   c. 37.5%

   d. 3.8%

26. Find $(\frac{2}{3})^2$.

   a. $\frac{5}{9}$

   b. $\frac{1}{3}$

   c. $\frac{1}{6}$

   d. $\frac{4}{9}$

27. Which of these equations is incorrect?

   a. $\sqrt{16} + \sqrt{9} = \sqrt{(16 + 9)}$

   b. $\sqrt{4} \times \sqrt{36} = \sqrt{(4 \times 36)}$

   c. neither is incorrect

   d. both are incorrect

28. What is the median of the following group of numbers? 5 10 15 20 25 30 36

   a. 36

   b. 22.5

   c. 20

   d. 5

29. Melanie threw a party and bought 4 one-pound platters of deli meat. At the end of the party, there were $\frac{2}{5}$ pound of roast beef, $\frac{3}{7}$ pound of turkey breast, $\frac{1}{8}$ pound of salami, and $\frac{1}{4}$ pound of bologna remaining. What fraction of the original four pounds of meat was left after the party?

   a. $1\frac{57}{290}$ pounds

   b. $1\frac{59}{280}$ pounds

   c. $1\frac{337}{280}$ pounds

   d. $1\frac{57}{280}$ pounds

30. There are 92 girls in Professor Martin's *Intro to Anthropology* class. This is 40% of all the students. What is the total number of students?

   a. 300

   b. 192

   c. 230

   d. 92

GEOMETRY

1. If $\frac{AB}{BD}$ is $\frac{2}{3}$, $\frac{BC}{DE}$ is

$BC \perp DE$
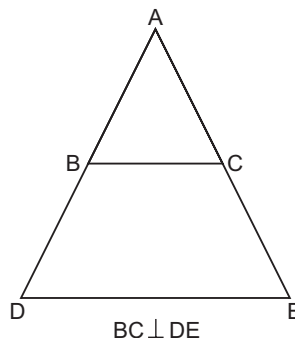
   a. $\frac{3}{2}$

   b. $\frac{2}{3}$

   c. $\frac{2}{5}$

   d. $\frac{5}{2}$

2. One side of a regular pentagon is 25 mm. What is the perimeter of the pentagon?

   a. 100 mm

   b. 125 mm

   c. 150 mm

   d. 625 mm

3. If ABCD is a rectangle, what is the value of angle *p*?
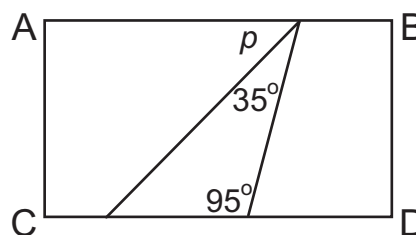
   a. 50°

   b. 55°

   c. 65°

   d. It cannot be determined.

4. A line contains the points $(-3, 5)$ and $(8, 10)$. What is the slope of the line?

   a. 1
   b. $\frac{5}{11}$
   c. -1
   d. $-\frac{5}{11}$

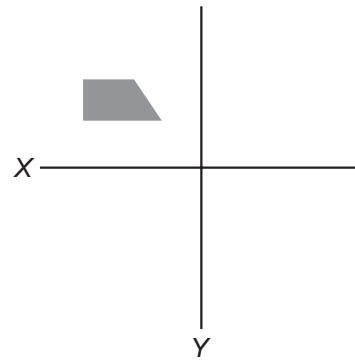**5.** If quadrilateral Q is reflected across the *y*-axis, what will the result be?
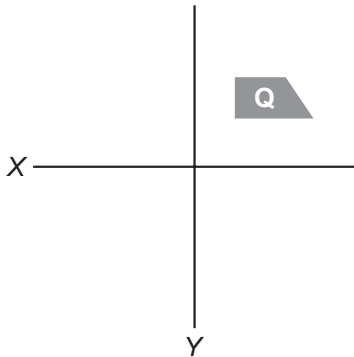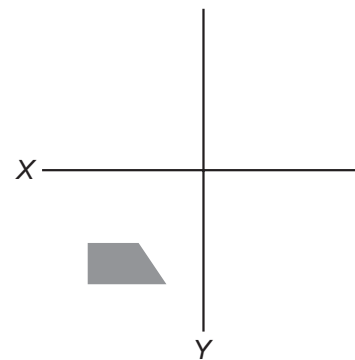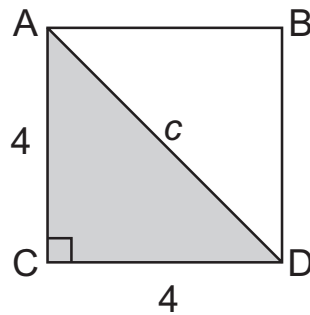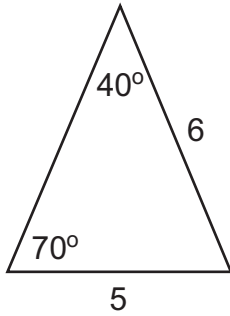

   a.
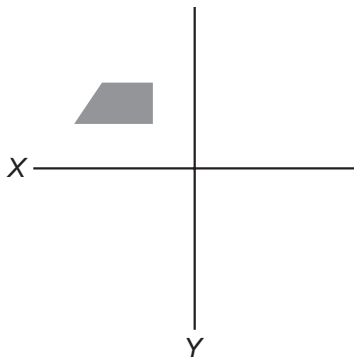
   b.
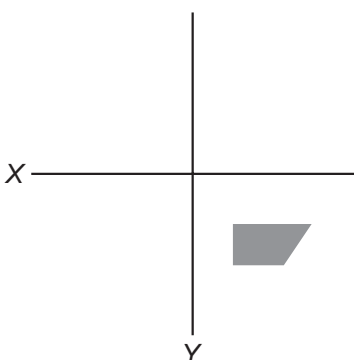
   c.

   d.

6. If ABCD is a square with side = 4, what is its diagonal?

   a. $\sqrt{8}$
   b. $2\sqrt{2}$
   c. $4\sqrt{2}$
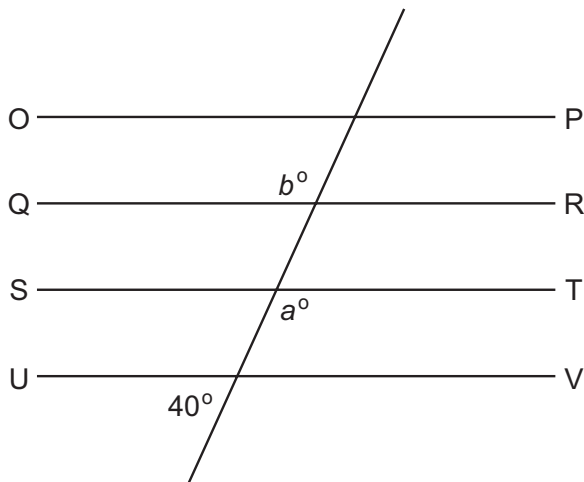   d. $2\sqrt{8}$

7. What is the perimeter of the triangle below?

- **a.** 14
- **b.** 16
- **c.** 17
- **d.** 30

8. A triangle has 2 sides that measure 14 cm and 17 cm respectively. Which of the following could be the length of the triangle's third side?

- **a.** 33 cm
- **b.** 31 cm
- **c.** 25 cm
- **d.** 3 cm

Use the diagram below to answer questions 9 and 10.

9. If in the figure above, OP, QR, ST, and UV are parallel, what is the value of angle *a*?

- **a.** 40
- **b.** 50
- **c.** 120
- **d.** 140

10. What is the value of angle *b*?

- **a.** 40
- **b.** 50
- **c.** 120
- **d.** 140

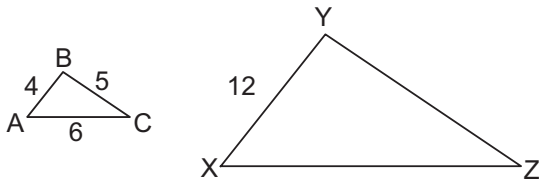**11.** Refer to the three figures below:
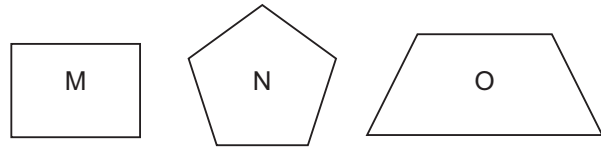
Which of the following statements are true?

- **a.** Figure M has 360°
- **b.** Figure N has 360°
- **c.** Figure O has 360°
- **d.** Both **a** and **c** are true.

12. What is the area of the parallelogram below?
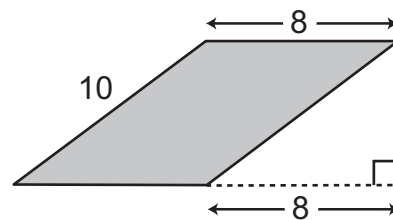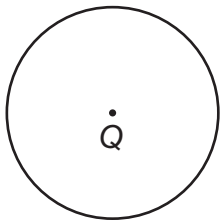

- **a.** 80
- **b.** 48
- **c.** 40
- **d.** 32

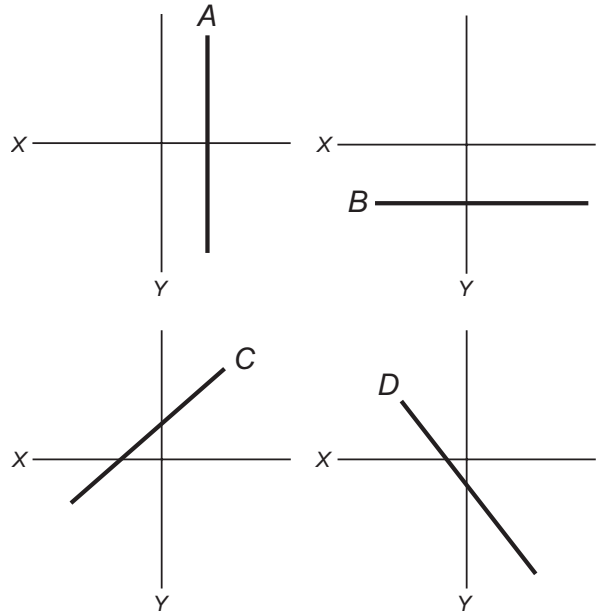**13.** If triangle ABC is similar to triangle XYZ, what is the value of XZ + YZ?

a. 33
b. 22
c. 11
d. It cannot be determined.

14. Which line is perpendicular to the line $y = -5x - 3$?

a. $y = -5x + 3$
b. $y = 5x - 3$
c. $y = \frac{1}{5}x + 4$
d. $y = -\frac{1}{5}x + 4$

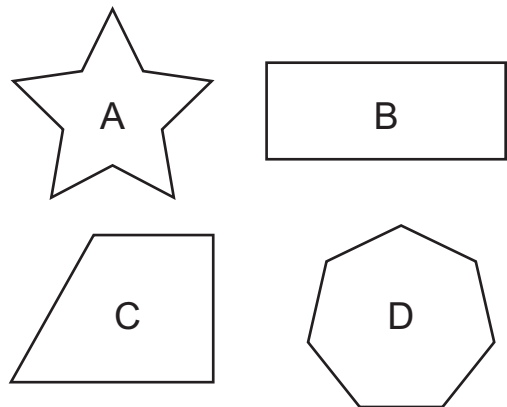**15.** If the area of circle Q is 36π, what is its diameter?

a. 6
b. 12
c. 6π
d. 12π
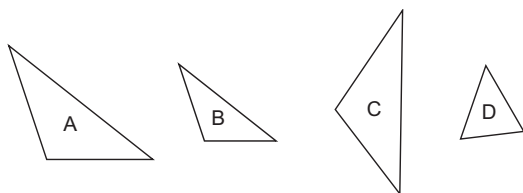
16. Which line below has *zero slope*?

a. Line *A*
b. Line *B*
c. Line *C*
d. Line *D*

17. Which of the following shapes have a line of symmetry?

a. A and B only
b. B, C, and D only
c. B and D only
d. A, B, and D only

18. Which of the following polygons are congruent?

    a. A and B
    b. B and C
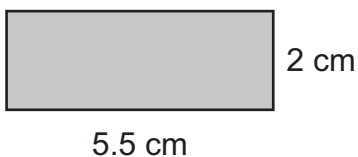   **c.** A and C
    d. A and D

19. How many times does the graph of $y = x^2 - 4$ cross the x-axis?
    a. not at all
    b. once
    c. twice
    d. It cannot be determined.

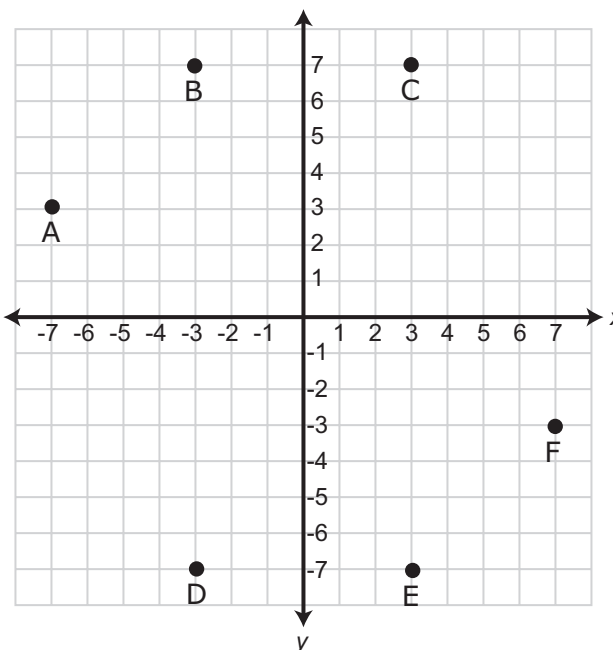**20.** If the sphere below has a radius $= \frac{3}{2}$, what is its volume?
    a. $\frac{9}{2}\pi$
    b. $\frac{9}{4\pi}$
    c. 9π
    d. 2π

21. If the length of the rectangle below is doubled, what happens to its area?

    2 cm

5.5 cm

    a. It remains the same.
    b. It is doubled.
    c. It is tripled.
    d. It is quadrupled.

22. Which point is located at $(-3, 7)$?

    a. A
    b. B
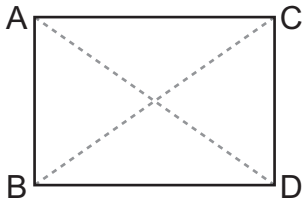   **c.** D
    d. E

23. What is the height of a triangle with a base of 20 and an area of 120?
    a. 5
    b. 10
    c. 12
    d. It cannot be determined.

24. Which equation represents a line parallel to $y = 3x - 5$?
    a. $y = \frac{1}{3}x - 5$
    b. $y = -\frac{1}{3}x + 4$
    c. $y = 3x + 5$
    d. $y = -3x - 5$

25. If ABCD is a rectangle, which of the following MUST be true?

a. AC is twice AB
b. AD bisects BC
c. AC equals DC
d. AD bisects AC

ALGEBRA

1. One number is five less than another number. If both numbers add to twenty-three, what is the larger number?

a. 18
b. 14
c. 9
d. 5

2. If you calculate the product of 4 more than the value of 3 times x and 1 less than x, which of the following choices would represent an equivalent expression?

a. $-3x^2 + 7x + 4$
b. $3x^2 - x - 4$
c. $3x^2 + 7x - 4$
d. $3x^2 + x - 4$

3. The expression $\frac{x^2 - 49}{x^2 + 6x - 7}$ is equivalent to:

a. $\frac{x - 7}{x - 1}$
b. $\frac{x + 7}{x + 1}$
c. $\frac{x - 7}{x + 1}$
d. $\frac{x + 7}{x - 3}$

4. One week, Sal earned $20 more than twice the amount that Doug made. If their combined earnings for the week was $460, which equation can be used to determine how much Doug made that week?

a. $D = \frac{S + 20}{2}$
b. $D = 460 + S$
c. $D = 460 - (20 + 2D)$
d. $D = 20 + 2D$

5. $(\frac{3x^4}{2y})(\frac{6y^3}{21x})$ is equivalent to

a. $\frac{9x^4y^3}{23xy}$
b. $\frac{3x^3y^2}{7}$
c. $\frac{3xy^3}{7xy}$
d. $\frac{x^4y^3}{3}$

6. $2x + 4 < -12$ is equivalent to

a. $x < -8$
b. $x < 8$
c. $x < -4$
d. $x < 4$

7. If $b = -5$, then $(\frac{1}{6})(b^2 + b)$ is equal to

a. $\frac{10}{3}$
b. $-\frac{10}{3}$
c. 5
d. -5

8. What is the value of $3x^2 - 2x + 5$ when $x = -2$?

a. -1
b. 11
c. 13
d. 21

9. If b is greater than 5, then $b + 3$ must be

a. between 3 and 5.
b. less than 5.
c. greater than 2.
d. greater than 8.

10. If $(x - 2)^2 = 0$, what is the value of x?

    a. 2

    b. $\frac{1}{2}$

    c. $-\frac{1}{2}$

    d. -2

11. Solve for x: $5x - 6 = 3x + 16$

    a. 5

    b. 11

    c. -5

    d. -11

12. What is the value of $5q - q^2$ when $q = 6$?

    a. 66

    b. 30

    c. 6

    d. -6

13. What are the solutions to $x^2 + 2x - 15 = 0$?

    a. $x = 3, 5$

    b. $x = -3, 5$

    c. $x = -3, -5$

    d. $x = 3, -5$

14. Solve for x: $-5x - 5 = 30$

    a. -6

    b. 6

    c. -7

    d. 7

15. $-3x < 9$ is equivalent to

    a. $x > -3$

    b. $x > 6$

    c. $x < -3$

    d. $x > 6$

16. $(8x^3y)(2x^5y^9)$ is equivalent to

    a. $16x^8y^{10}$

    b. $10x^8y^9$

    c. $6x^8y^8$

    d. $16x^8y^8$

17. Which of the following choices is equivalent to the inequality $9(P + 1) > -2(-P + 2.5)$?

    a. $P > -\frac{4}{7}$

    b. $P < -\frac{4}{7}$

    c. $P > -2$

    d. $P < -2$

18. At a garage sale, Dave buys three psychology books that cost $3.25 each, and a vocabulary book that costs five dollars. Which expression represents the amount of change, C, he should get when paying with a twenty-dollar bill?

    a. $20 - 3.25 - 3(5) = C$

    b. $20 - 3(3.25) - 5 = C$

    c. $3(3.25) + 5 = C$

    d. $20 - 3.25 - 5 = C$

19. Which of the following choices represents a solution to the equation $3x^2 - x - 2 = 0$?

    a. -1

    b. $-\frac{2}{3}$

    c. 1

    d. $\frac{2}{3}$

20. What are the solutions to $B^2 + 8B + 12 = 0$?

    a. $B = -4, 2$

    b. $B = -8, 4$

    c. $B = -2, 6$

    d. $B = -2, -6$

21. Solve for x: $2x^3 + 8 = 62$

    a. 3

    b. 3 or -3

    c. -3

    d. $\frac{1}{3}$

22. $\left(\frac{x}{3}\right) + \left(\frac{3x}{10}\right) - \left(\frac{2x}{5}\right)$ is equivalent to

  a. $\frac{7x}{15}$

  b. $\frac{31x}{30}$

  c. $\frac{8x}{18}$

  d. $\frac{7x}{30}$

23. If $2x - y = 4$ and $x + y = 8$, then what is x equal to?

  a. 4

  b. 12

  c. -4

  d. -12

24. What is the value of the expression $5x^2 + 2xy^3$ when $x = 3$ and $y = -2$?

  a. -3

  b. 3

  c. -93

  d. 93

25. If $a = 2$, $b = -1$, and $c = \frac{1}{2}$, $\frac{2a - b + 5}{c}$ is equal to which of the following?

  a. 5

  b. 10

  c. 20

  d. 25

ANSWERS

OPERATIONS WITH WHOLE NUMBERS

1. **b.** This is a problem with several steps. First, figure out how many *dozen* bracelets Janice makes each day. To do this you would divide 36 by one dozen, or 12, and $36 \div 12 = 3$. So she makes 3 dozen bracelets per day. Now, figure out how much she makes on bracelets per day: $\$18 \times 3 = \$54$. Finally, figure out how much Janice makes per week. To do this, you must multiply how much she makes per day ($\$54$) by how many days per week (5) she works: $\$54 \times 5 = \$270$.

2. **a.** This problem has multiple steps. First, figure out what Deanna spent: $\$7$ for popcorn, 2 hot dogs $\times$ 2 girls $\times$ $\$3$ each equals $\$12$, 2 sodas $\times$ $\$4 = \$8$. Then add them up: $\$7 + \$12 + \$8 = \$27$. Next, figure out what Jamie spent: $\$13 \times 2 = \$26$. Lastly, subtract the two numbers: $\$27 - \$26 = \$1$. Deanna spent $\$1$ more.

OPERATIONS WITH FRACTIONS

3. **c.** Converting mixed numbers into improper fractions is a two-step process. First, multiply the whole number by the denominator of the fraction. Then, add that number (or product) to the numerator of the fraction. So $1\frac{1}{8} = \frac{9}{8}$ and $1\frac{3}{5} = \frac{8}{5}$. Area = length $\times$ width, so $\frac{9}{8} \times \frac{8}{5} = \frac{72}{40} = \frac{9}{5} = 1\frac{4}{5}$. **Hint:** To convert the improper fraction $\left(\frac{9}{5}\right)$ into a mixed number, you divide the denominator (5) into the numerator (9). Any remainder becomes part of the mixed number (5 goes into 9 once with a remainder of 4, hence $1\frac{4}{5}$).

4. **b.** First, set up your equation: $\frac{5}{9} \div \frac{5}{9}$. Next you must convert it into a multiplication problem. You do this by multiplying the first number by the *reciprocal* of the second number. (You find the reciprocal by turning the fraction upside down.) So, it becomes: $\frac{5}{9} \times \frac{9}{5}$, which equals $\frac{45}{45}$, which equals 1. **Hint:** You can always remember that any number divided by itself equals one.

OPERATIONS WITH DECIMALS

5. **d.** This is a two-step problem. First, add all of the money the girls have, as well as the money from their dad. It is very important to make sure the decimals are lined up properly.

$$
\begin{array}{r}
5.00 \\
13.00 \\
2.50 \\
7.19 \\
2.00 \\
+10.00 \\
\hline
40.42
\end{array}
$$

The total is $40.42. Then you have to subtract this number from the cost of the bracelet, which is $50.00. Again, remember to line up your decimal points.

$$
\begin{array}{r}
50.00 \\
-40.42 \\
\hline
9.58
\end{array}
$$

The answer is $9.58.

6. **c.** When doing this problem, it is important that you know how to find the area of something. Memorize this: Area = Length × Width. If her deck is 12.84 feet by 14.3 feet, then you must multiply these two numbers. 12.84 × 14.3 = 183.612. Make sure you count over from the right the correct number of decimal places, in this case, three.

Hint: One way you can check if your answer makes sense is to round the numbers (13 × 14) and see if the answer is somewhat close (13 × 14 = 182, which is very close, so it makes sense. That is why letter **c** is correct and letters **b** and **d** are incorrect.)

Ratio and Proportion

7. **d.** The first thing you have to do when solving a problem like this is set up a proportion: $\frac{27}{3} = \frac{x}{7}$. In other words, 27 is to 3 as *what* is to 7. We are using an x to symbolize the number we are solving for. Then it is only a matter of reducing the first fraction:

$$\frac{9}{1} = \frac{x}{7}$$

and then cross-multiplying:

$$1(x) = 9(7)$$

$$x = 63.$$

8. **c.** You have to look at the question and see that the number of boys plus the number of girls equals the total, so with this information you can make an equation:

$$3x + 4x = 28$$

$$7x = 28$$

$$x = 4$$

Then you have to plug the answer back into the equation.

$$3(4) + 4(4) = 28$$

$$12 + 16 = 28$$

or

12 (boys) + 16 (girls) = 28, so there are 16 girls, answer **c.**

PERCENTS

9. **b.** To change a percent to a decimal, first you have to drop the percent sign, so to change 35% to a decimal, you drop the percent sign and make it 35. Next, you would move the decimal point two digits to the left. 35 is the same as 35.0, so if you move the decimal point two digits to the left you get .35, and .35 is the same as 35%.

10. **c.** For this question, you know that 9 out of 75 couldn't attend the wedding, so you would write that out as a fraction: $\frac{9}{75}$. Next, you would divide: $9 \div 75 = .12$. To change a decimal to a percent, move the decimal point two places to the right, making it 12.0. Add a percent sign to get 12.0%, which is 12%.

ABSOLUTE VALUE

11. **a.** When you are looking for the absolute value of a number, you are looking to see how many places away from zero it is. For example, 4 is 4 places away from zero. But also see that −4 is 4 places from zero. So the easiest way to remember absolute value is to find the positive number. Since $47 - 64 = -17$, the absolute value (or positive) of −17 is 17, answer **a.**

12. **d.** Don't let the fraction throw you off; you are still simply trying to find the positive value of that number, which is $\frac{2}{3}$.

EXPONENTS

13. **c.** When any number is squared, that means you are multiplying it by itself. $43 \times 43 = 1849$. Then

it is the simple matter of multiplying that answer by 4: $1849 \times 4 = 7396$.

14. **c.** This is a multi-step problem. First multiply $-\frac{1}{5}$ by $-\frac{1}{5}$. A negative times a negative always equals a positive, so $-\frac{1}{5} \times -\frac{1}{5} = \frac{1}{25}$. Then, since the problem is asking you to find $-\frac{1}{5}$ *cubed*, you multiply that product again by $-\frac{1}{5}$: $\frac{1}{25} \times -\frac{1}{5} = -\frac{1}{125}$. If you chose answer **d**, you only multiplied $-\frac{1}{5}$ by 3, and if you chose answer **a**, you forgot about the signs. These are some common mistakes that you should try to avoid.

SCIENTIFIC NOTATION

15. **b.** You start with 3,600,000, and then you count over from the right six places to find where you will put your decimal point: 10^6 equals 1,000,000, and $3.6 \times 1,000,000 = 3,600,000$.

16. **c.** $7.359 \times 10^{-6} = 7.359 \times 0.000001 = 0.000007359$. This is the same as simply moving the decimal point to the left 6 places.

SQUARE ROOTS

17. **c.** First, when you are finding the square root of a number, ask yourself "What number times itself equals the given number?" Next, to get the answer to this problem, you can figure out each equation: It's not **a** because $\sqrt{36} = 6$, $\sqrt{64} = 8$ and $\sqrt{100} = 10$, and $6 + 8 = 14$, not 10. It's not **b** because $\sqrt{25} = 5$, $\sqrt{16} = 4$ and $\sqrt{41}$ is about 6.4, and $5 + 4 = 9$, not 6.4. It is **c** because $\sqrt{9} = 3$, $\sqrt{25} = 5$ and $\sqrt{64} = 8$, and $3 + 5 = 8$. **Hint:** Regarding answer **a**, you can also remember that square roots can be multiplied or divided, but not added or subtracted.

18. **b.** $\sqrt{12}$ is the same as $\sqrt{4} \times \sqrt{3}$. The square root of 4 is 2. So $5 \times \sqrt{12}$ is the same as $5 \times 2 \times \sqrt{3}$, which equals $10\sqrt{3}$. Remember, square roots can be multiplied or divided, but they cannot be added or subtracted.

CALCULATING MEAN, MEDIAN, AND MODE

19. **b.** The mean is the average. To calculate the average you add all the numbers up, and then divide by the number of tests: $92 + 89 + 96 + 93 + 93 + 83 = 546$. Next, divide: $546 \div 6 = 91$. It is not answer **a** because 93 is the mode, the number that appears most frequently. It is not answer **c** because 92.5 is the median.

20. **c.** The mode is the number that appears most frequently in a series—in this case, it is 9.

SKILL BUILDER QUESTIONS

1. **c.** First add $47 + 84 = 131$. Then multiply by four: $131 \times 4 = 524$. Last, subtract the amount he already has from the total that he needs to buy to get the answer: $524 - 131 = 393$.

2. **a.** Write out the equation. Remember *is* means *equals* and *of* means *times*. To find the answer, you first write one-eighth and one-sixth as fractions, and then you multiply straight across: $\frac{1}{8} \times \frac{1}{6} = \frac{1}{48}$.

3. **a.** Zelda saves $\$10 + \$25 + \$13$, which equals $\$48$, and her dad contributes $\$48 \times 0.1 = \$4.80$. $\$48 + \$4.80 = \$52.80$ total.

4. **b.** You set up the ratio, 1:2, and then you are trying to find x in the ratio 3:x. Three times one equals 3, so three times two equals 6.

5. **c.** First, remove the percent sign to get 42. Next, write the number over 100, to get $\frac{42}{100}$. Lastly, reduce the fraction to get $\frac{21}{50}$.

6. **b.** First calculate $\frac{3}{4} \div \frac{1}{5}$. You multiply the first fraction by the reciprocal of the second: $\frac{3}{4} \times \frac{5}{1} = \frac{15}{4}$. Then you convert the improper fraction $\frac{15}{4}$ into a mixed number: $\frac{15}{4} = 3\frac{3}{4}$. The absolute value of $3\frac{3}{4}$ is the positive value, which is still $3\frac{3}{4}$.

7. **a.** First multiply $-11 \times -11 = 121$. Then you multiply 121×-11 to get -1331. $4 \times 4 = 16$. You add the two numbers together, $-1331 + 16 = -1315$.

8. **d.** $4.0 \times 10^4 = 40,000$ (you move the decimal point four places to the right). Next, $40,000 \times 3,000 = 120,000,000$. Now move the decimal point eight places to the left to get 1.2×10^8.

9. **c.** $\sqrt{64} = 8$ because $8 \times 8 = 64$, and $\sqrt{36} = 6$ because $6 \times 6 = 36$, and $8 + 6 = 14$.

10. **c.** The mode is the number that appears *most frequently*, in this case, $\sqrt{3}$.

11. **b.** First, for Brian, divide to determine the number of 20-minute segments there are in an hour: $60 \div 20 = 3$. Now multiply that number by the number of times Brian can circle the block: $3 \times 4 = 12$. Brian can make it around 12 times in one hour. Now do the same thing for Jaclyn: $60 \div 12 = 5$, and $5 \times 3 = 15$. Lastly, subtract $15 - 12 = 3$. Jaclyn can go around three more times in one hour.

12. **b.** First, write $\frac{2}{5}$ of 255 as an equation: $\frac{2}{5} \times \frac{255}{1} = \frac{510}{5} = 102$.

13. **b.** Make sure you line up your decimals properly when you add $373.5 + 481.6 + 392.8 + 502 + 53.7$ to get 1803.6 miles.

14. c. First set up a proportion: $\frac{18}{1} = \frac{x}{6}$, then solve for x. $1x = 108$.

15. a. First, remove the percent sign: $12\frac{1}{2}$. Next, write the number over 100: $\frac{12\frac{1}{2}}{100}$. Then, write the fraction as a division problem: $12\frac{1}{2} \div 100$. Change the mixed number into an improper fraction: $\frac{25}{2} \div 100 = \frac{25}{2} \times \frac{1}{100} = \frac{25}{200}$, which reduces to $\frac{1}{8}$.

16. a. When you are looking for the absolute value of a number, you are looking for the positive value of that number, which in this case is 123.456.

17. a. Remember, a negative times a negative equals a positive, so: $-12 \times -12 = 144$.

18. b. You have to move the decimal point over twelve places to the right, to get 3,000,000,000,000, which is three trillion.

19. c. To find the square root of a number, ask yourself "What number times itself equals the given number?" Eleven times itself, or 11^2, is 121; therefore, the square root of 121 is 11.

20. a. The mean is the *average*. To find the average, add $522.75 + 498.25 + 530$ to get 1551. Then divide by the number of paychecks (3): $1551 \div 3 = 517$. It is not answer **b** because that is the middle number, which is the median.

21. d. First you add up what she made: $153 + 167 + 103 = 423$. Then you add up what she spent: $94 + 19 = 113$. Lastly, you subtract the second number from the first to see how much is left: $423 - 113 = 310$.

22. d. This is a multiplication problem. First, set up your equation by writing one-half and one-quarter as fractions: $\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$.

23. c. Multiply the cost per yard by the number of yards being purchased: $13.5 \times 3.79 = 51.165$, which is closest to $52.

24. a. If 50 cups cost $75, and 200 cups cost *what* amount, substitute x for *what* and set up this proportion: $\frac{50}{75} = \frac{200}{x}$. Next, cross multiply to solve for x: $50x = 200 \times 75$, which means $50x = 15,000$, so $x = 300$.

25. c. Divide the fraction's denominator into the numerator: $3 \div 8 = .375$, and then move the decimal point two places to the right: 37.5. Lastly, add the percent sign: 37.5%.

26. d. You must multiply $\frac{2}{3}$ by itself: $\frac{2}{3} \times \frac{2}{3} = \frac{4}{9}$.

27. a. Square roots can be multiplied and divided, but they cannot be added or subtracted. You can also test the equations: $\sqrt{16} = 4$, $\sqrt{9} = 3$, $\sqrt{25} = 5$, and $4 + 3 = 7$, not 5. $\sqrt{4} = 2$, $\sqrt{36} = 6$, $\sqrt{144} = 12$, and $2 \times 6 = 12$.

28. c. The median is the number in the *middle* of the series—in this case, 20.

29. d. The common denominator of the fractions is 280. Convert all your fractions: $\frac{2}{5} = \frac{112}{280}$, $\frac{3}{7} = \frac{120}{280}$, $\frac{1}{8} = \frac{35}{280}$, $\frac{1}{4} = \frac{70}{280}$. Next you add them up: $\frac{112}{280} + \frac{120}{280} + \frac{35}{280} + \frac{70}{280} = \frac{337}{280}$. Last, convert the improper fraction into a mixed number: $\frac{337}{280} = 1\frac{57}{280}$.

30. c. Ask yourself, "92 is 40% of what number?" To write this as an equation, remember that *is* means *equals*, *of* means *times* and *what number* means x. Also, change 40% to .40, so our equation is $92 = (.40)(x)$. Divide both sides by .40 to get $x = 230$.

There are 230 kids total because 92 is 40% of 230. You can check your answer: $.4 \times 230 = 92$.

GEOMETRY

1. **c.** Notice that this figure contains similar triangles. Similar triangles are in proportion. Because AB:BD = 2:3, then we know that the triangles are in a 2:5 ratio.
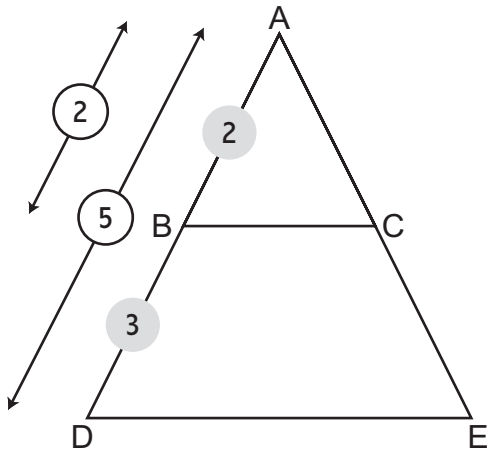

This means that the bases of these 2 triangles will also be in a 2:5 ratio.

2. **b.** A pentagon has five sides. If a pentagon is regular, that means that all five sides are equal. To find the perimeter, we just add up the distance around the pentagon.
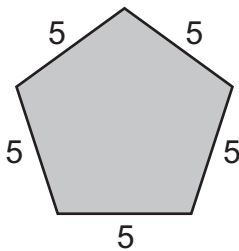
$25+25+25=25+25 = 125$ mm.

3. **a.** First, notice the triangle in the middle of the rectangle. All triangles have 180°, so we know that the 3rd angle is 50°. (95° + 35° + 50° = 180°) Next, notice how this question is similar to a Parallel Lines question:
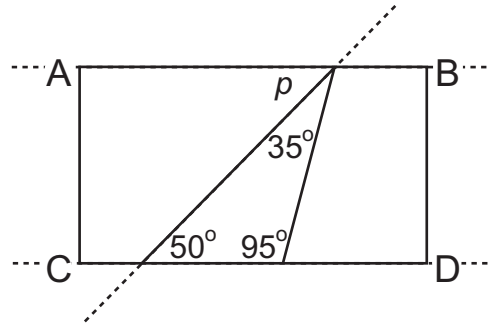
Angle p and 50° are alternate interior angles, and are thus equal: $p = 50°$.

4. **b.** The slope is calculated by using the formula $m = \frac{\Delta y}{\Delta x}$, where m is the slope of the line.

We will use the points $(-3, 5)$ and $(8, 10)$ in the slope formula:

$$m = \Delta y = \frac{y_2 - y_1}{\Delta x} = x_2 - x_1$$

$$= \frac{10 - 5}{8 - (-3)}$$

$$= \frac{10 - 5}{8 + 3}$$

$$= \frac{5}{11}$$

5. **a.** A reflection is like a mirror image. If we are reflecting the figure across the y-axis, then we are making a mirror image of it across the vertical axis. Choice **a** meets this description.

6. **c.** Notice how the diagonal is really the hypotenuse, c, of a right triangle:

A ▢ B

4   c

C ▢ D
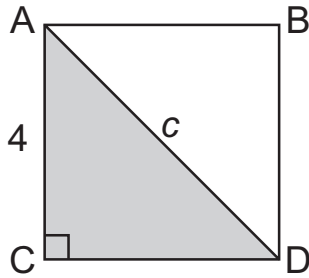
We can use the Pythagorean theorem, $a^2 + b^2 = c^2$. This equation becomes $4^2 + 4^2 = c^2$, or $16 + 16 = c^2$, or $32 = c^2$. This means that $c = \sqrt{32}$. $\sqrt{(32)} = \sqrt{(16 \times 2)} = 4\sqrt{2}$.
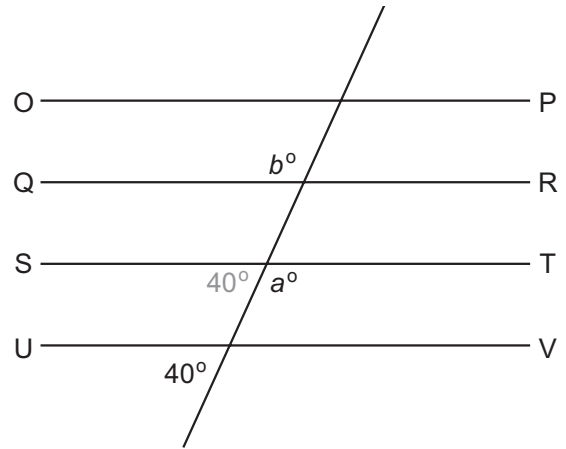
7. **c.** The missing angle must be 70° because all the angles inside a triangle add up to 180°. Notice that there is a 6 opposite the 70° angle in the figure. The side opposite the newly-labelled 70° angle will also be 6, because equal sides are opposite equal angles.

(Triangle diagram: 40° at top, sides 6 and 6, base angles 70° and 70°, base 5)
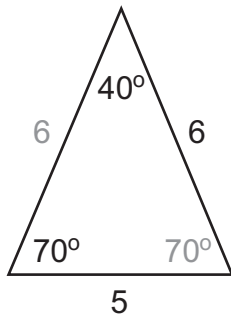
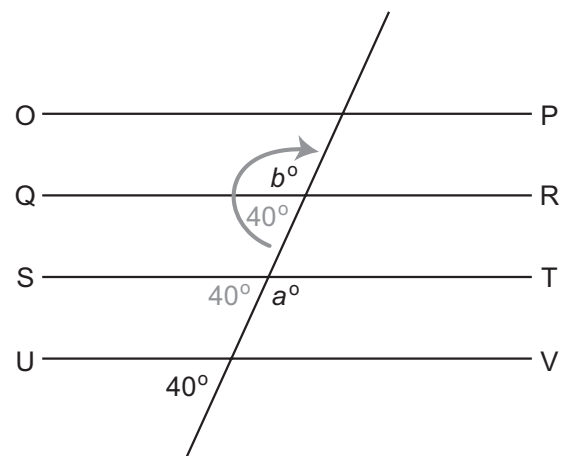To calculate the perimeter, you just add up all the sides: $5 + 6 + 6 = 17$.

8. **c.** The third side of the triangle must be less than the sum of the other two sides $(17 + 14)$ and greater than their difference $(17 - 14)$. This means that the third side must be less than 31 and greater than 3. Only choice **c** fits these criteria.

9. **d.** Looking at the diagram, we can fill 40 for the angle created when the line crosses ST.

(Diagram: parallel lines O–P, Q–R with $b°$, S–T with 40° and $a°$, U–V with 40°, crossed by a transversal)

This is because the line will create corresponding angles for all the parallel lines that it crosses. This newly labeled 40° angle and angle a make a straight line. Because straight lines are 180°, we know that angle a must be 140° $(40° + 140° = 180°)$.

10. **d.** Looking at the diagram we can fill in some 40° angles because we know that the intersecting line will generate corresponding angles for all the parallel lines that it crosses.

(Diagram: parallel lines O–P, Q–R with $b°$ and 40°, S–T with 40° and $a°$, U–V with 40°, crossed by a transversal)

Notice how the 40° under angle b and angle b create a straight line. Because straight lines are 180°, we know that angle b must be 140° $(40° + 140° = 180°)$.

11. **d.** All quadrilaterals (four-sided figures) have 360°, so M and O have 360°. Figure N has five sides. The formula for figuring out the number of degrees in a polygon is: $(n - 2) \times 180$, where n is the number of sides. This means that figure N has $(5 - 2) \times 180 = 3 \times 180 = 540°$. Thus **d** is the correct answer.

12. **b.** The area formula for a parallelogram is Area $= base \times height = bh$. We will need to figure out the height of the parallelogram. Notice the right triangle created by the dashed lines in the figure below:
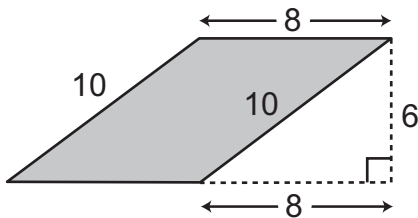
You can use the Pythagorean theorem, $a^2 + b^2 = c^2$ to determine that the height is 6. ($8^2 + h^2 = 10^2$; $64 + h^2 = 100$; $h^2 = 36$, thus $h = 6$). Then put the dimensions into the area formula: Area $= bh = (8)(6) = 48$.

13. **a.** Because triangle ABC is similar to triangle XYZ, we know that their sides are in proportion with one another. Since these similar triangles are referred to as ABC and XYZ, we know that A corresponds with X, B corresponds with Y, and C corresponds with Z.
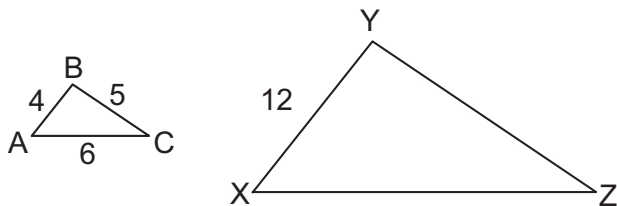

The figure shows us that AB is 4, and that the corresponding side for the bigger triangle, XY, is

12. Compare 4 to 12. You should notice that 12 is *three times* 4. This means that every side on the bigger triangle is *three times* the smaller one's. XZ would be *three times* AC: $3 \times 6 = 18$. YZ would be *three times* BC: $3 \times 5 = 15$. Adding the two sides together, we have: $18 + 15 = 33$.

14. **c.** Perpendicular lines have slopes that are negative reciprocals of each other. Remember that the slope is the m on the formula $y = mx + b$. The given line has a slope, m, equal to -5. First take the reciprocal of -5. -5 is the same as $-\frac{5}{1}$. To take the reciprocal, we just reverse the numerator and denominator: $-\frac{1}{5}$. We also need to take the negative of this: $-(-\frac{1}{5}) = +\frac{1}{5}$. Only choice **c** has $m = \frac{1}{5}$.

15. **b.** The area of a circle is $A = \pi r^2$. Here we know that the area is 36π, so $36\pi = \pi r^2$. Note that you can divide both sides by π to get $36 = r^2$. Take the square root of both sides to get $r = 6$. At this point DO NOT pick choice **a**, because the question asked you to find the *diameter*! The diameter is $2r = 2(6) = 12$. Choose choice **b**.

16. **b.** Line B has zero slope. Slope, $m = \frac{\Delta y}{\Delta x}$. A line will have $m = 0$ when $\Delta y = 0$.
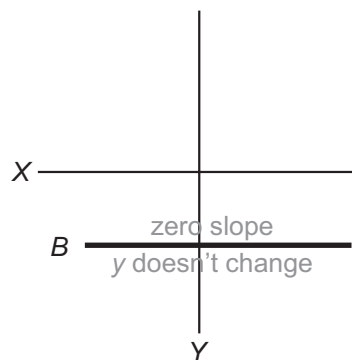
17. **d.** A line of symmetry is a line that can be drawn across a figure that divides the figure into two

mirror-image pieces. Notice the lines of symmetry drawn below:
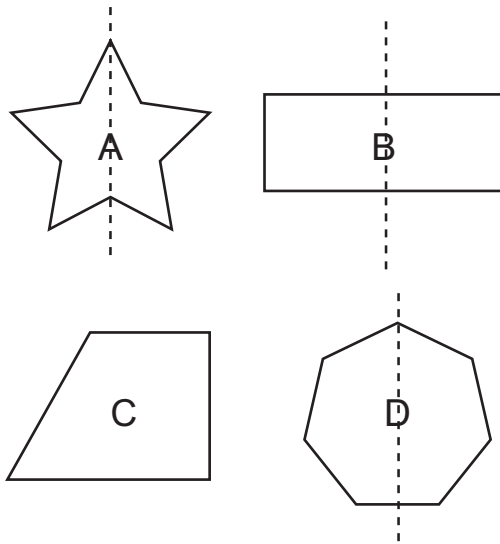
Thus, choice **d**, "A, B, and D only" is the correct answer.

18. **c.** *Congruent* means the same size and shape. Notice that if you rotate triangle C, it is the same as A:


Thus, triangle A and triangle C are congruent.

19. **c.** The graph of $y = x^2 - 4$ will cross the x-axis at any point in the format $(x, 0)$. In other words, the graph will cross the x-axis when $y = 0$, so all you need to do is substitute 0 in for y in the given formula: $x^2 - 4 = 0$, so $x^2 = 4$, so $x = +2$ or -2. This means that the graph will cross the x-axis *twice*, namely at the points $(-2, 0)$ and $(2, 0)$.

20. **a.** The volume of a sphere can be found by using the formula $V = \frac{4}{3}\pi r^3$. Remember how we said that answers would work out nicely if you weren't allowed access to a calculator during the test (Chapter 1)? Well here is a prime example, although it may have not been so obvious at first. When we put the given value for r, $\frac{3}{2}$ into the volume formula, we get $V = \frac{4}{3}\pi(\frac{3}{2})^3 = \frac{4}{3}\pi(\frac{27}{8})$. Notice how easily this can be reduced to $\frac{9}{2}\pi$ by crossing out the fours and then dividing 27 by 3. Thus, **a** is correct.

21. **b.** First, calculate the original area using Area = *length* × *width*. A = 5.5 × 2 = 11. Next, draw yourself a diagram of the new rectangle:

2 cm

11 cm
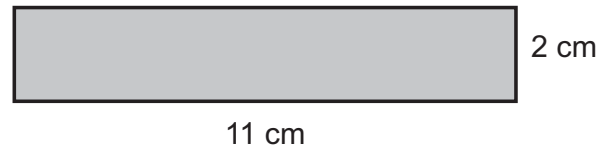
Let's calculate the area of this new rectangle: Area = length × width. A = 11 × 2 = 22. This area is *double* the original area.

22. **b.** The -3 is the x coordinate, so follow the x-axis (horizontal axis) to -3. Next, the 7 is the y coordinate, so go up 7 in the vertical direction to find the answer, point B.

23. **c.** Here we substitute the given information into the area formula $A = \frac{1}{2}bh$. We get $120 = \frac{1}{2}(20)(h)$, or $120 = 10h$, or $h = 12$.

24. **c.** Parallel lines have slopes that are equal. Remember that the slope is the m on the formula $y = mx + b$. The given line has a slope, m, equal to 3. Only choice **c** has $m = 3$.

25. **b.** Bisect means to cut in half. The diagonals of a rectangle bisect each other, thus **b** <u>MUST</u> be true.

ALGEBRA

1. **b.** Let's call the small number S and the larger number L. We know that the smaller number is five less than the larger, so we have $S = L - 5$. We also know that both numbers add up to 23, so we have $S + L = 23$. Substituting $S = L - 5$ into this equation, we get $(L - 5) + L = 23$, or $2L - 5 = 23$. Adding 5 to both sides we know that $2L = 28$. We divide by 2 to get $L = 14$.

2. **d.** The fact that you see x^2 in every answer choice is a clue that FOIL needs to be used. So what goes in each set of parentheses? The first pair of parentheses will be filled by "4 more than the value of 3 times x," which is represented mathematically as $(3x + 4)$. The second pair of parentheses will be filled by "1 less than x," which is simply $(x - 1)$. The question asks you to calculate a product, thus we multiply using FOIL:
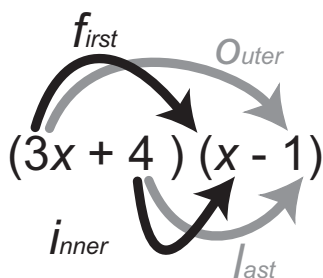
    $(3x + 4)(x - 1) = 3x^2 - 3x + 4x - 4$. This simplifies to $3x^2 + x - 4$.

3. **a.** First, let's take a look at the top part of the expression: $x^2 - 49$ can be factored into two sets of parentheses: $(x \pm ?)(x \pm ?)$. Because the coefficient on the x^2 is 1, we know the missing numbers add to 0 (because there is no x term the coefficient of x is 0) and multiply to 49 (the *lone number* is -49). Thus, the numbers are -7 and $+7$. The top part is really $(x - 7)(x + 7)$. Next, we consider the bottom part of the expression, or

$x^2 + 6x - 7$, and set up another set of parentheses: $(x \pm ?)(x \pm ?)$. Here the missing numbers add to 6 (the coefficient on the x term is 6) and multiply to -7 (the *lone number* is -7). Thus, the numbers are -1 and $+7$. The bottom part is really $(x - 1)(x + 7)$. So we put the top over the bottom to get:

$$\frac{(x - 7)(x + 7)}{(x - 1)(x + 7)}$$

Finally, notice that you can cross out an $(x + 7)$ on top and an $(x + 7)$ on the bottom. You are left with:

$$\frac{(x - 7)}{(x - 1)}$$

4. **c.** Let's call Sal's earnings S and Doug's earnings D. We know that Sal earned twenty dollars more than twice the amount that Doug made. Since "twice the amount that Doug made" would be $2D$, twenty dollars more than this would be $20 + 2D$, so $S = 20 + 2D$. We also know that their combined earnings was equal to \$460, so $S + D = 460$. We want an equation for D, so let's switch this second equation around by subtracting an S from both sides: $D = 460 - S$. Since we know $S = 20 + 2D$, the equation $D = 460 - S$ becomes $D = 460 - (20 + 2D)$.

5. **b.** Look at the numerators (upper part) and denominators (bottom part) of these fractions. $(\frac{3x^4}{2y})(\frac{6y^3}{21x})$ has a 3 in the top and a 21 in the bottom that can be reduced to a 1 and a 7, respectively, yielding $(\frac{x^4}{2y})(\frac{6y^3}{7x})$. Similarly, the top 6 and the bottom 2 can be reduced to a 3 and a 1, respectively, and we get $(\frac{x^4}{y})(\frac{3y^3}{7x})$. Now you need to consider how to divide when dealing with exponents. If you have the same base, when dividing values, you just subtract the exponents. Let's look at the base x. On top you have an x^4, and in the bottom you have an x, which is the same as

x^1. To divide x^4 by x^1, you just subtract $4 - 1$, to get x^3. The equation is now $(\frac{x^3}{y})(\frac{3y^3}{7})$. We divide y^3 by y, to get y^2 in the numerator. $(x^3)(\frac{3y^2}{7}) = \frac{3x^3y^2}{7}$.

6. a. First, subtract 4 from both sides of the equation $2x + 4 < -12$ to yield $2x < -16$. Next, divide everything by 2 to get $x < -8$.

7. c. Substitute -5 in for b in the given equation. Thus, $(\frac{1}{6})(b^2 + b) = (\frac{1}{6})(-5^2 + 5) = \frac{1}{6}(25 - 5) = \frac{1}{6}(20) = \frac{20}{6} = \frac{10}{3}$.

8. d. Put -2 in for x in the equation $3x^2 - 2x + 5$. Thus, the equation becomes $3(-2)^2 - 2(-2) + 5 = 3(4) - (-4) + 5 = 12 + 4 + 5 = 21$.

9. d. If b is greater than 5, then you can write $b > 5$. In order to compare this to $b + 3$, just add 3 to both sides of the inequality: $b + 3 > 5 + 3$, or $b + 3 > 8$. Thus, $b + 3$ must be *greater than 8*.

10. a. $(x + 2)^2 = 4x$ can be rewritten as $(x - 2)(x - 2) = 0$. So you know that $x - 2 = 0$, or $x = 2$.

11. b. $5x - 6 = 3x + 16$ can be simplified by first subtracting $3x$ from both sides to yield $2x - 6 = 16$. Now, you add both 6 to both sides to get $2x = 22$. Dividing both sides by 2, you get $x = 11$.

12. d. Replace every q with a 6 in the equation $5q - q^2$ to yield $5(6) - (6)^2 = 30 - 36 = -6$.

13. d. $x^2 + 2x - 15 = 0$ can be factored into two sets of parentheses: $(x \pm ?)(x \pm ?)$. Because the coefficient on the x^2 is 1, we know the missing numbers add to 2 (because the coefficient of x is 2) and multiply to -15 (the *lone number* is -15). Thus, the numbers are -3 and $+5$. The equation is equivalent to $(x - 3)(x + 5) = 0$. This means $x - 3 = 0$ and $x + 5 = 0$, or $x = 3$ and $x = -5$, respectively.

14. c. $-5x - 5 = 30$ can be simplified by first adding 5 to both sides: $-5x = 35$. Next, divide by -5 to yield $x = -7$.

15. a. Divide both sides of $-3x < 9$ by -3, but be sure to flip the sign! Thus, you get $x > -3$.

16. a. $(8x^3y)(2x^5y^9)$ can first be reduced to $16x^3yx^5y^9$. If you have the same base, when multiplying exponents, remember to just add the powers. For the x terms, you add $3 + 5$ to get x^8. Since y is the same as y^1, when you add the powers of the y terms you get $1 + 9$, or y^{10}. Thus, the final answer is $16x^8y^{10}$.

17. c. The given equation is $9(P + 1) > -2(-P + 2.5)$. First, we distribute the 9 to get $9P + 9 > -2(-P + 2.5)$. Next, we distribute the -2 and the inequality becomes $9P + 9 > (-2)(-P) + (-2)(2.5)$, or $9P + 9 > 2P + (-5)$, or $9P + 9 > 2P - 5$. Now we subtract $2P$ from both sides to get $7P + 9 > -5$. Then, we subtract 9 from both sides to get $7P > -14$. Finally, divide by 7 to get $P > -2$.

18. b. He starts with $20 but we have to subtract the cost of the three psychology books and the cost of the vocabulary book in order to figure out his change. Three psychology books at $3.25 each would be represented as 3×3.25 or $3(3.25)$. We have $20 - 3(3.25) - 5 = C$.

19. b. The expression $3x^2 - x - 2 = 0$ can be factored into two sets of parentheses: $(3x \pm ?)(x \pm ?)$. Because the coefficient on the x^2 is not 1, focus your attention on the *lone number*, -2, which indicates that the numbers you will stick in the parentheses have a product of -2. The numbers will be a combination of -1 and 2 or 2 and -1. Because one set of parentheses has a $3x$, placement

will matter and you have to just test out all combinations until one works. The working combination is $(3x + 2)(x - 1) = 0$. Next, you solve for x.

$$(3x+ 2) \qquad (x - 1) \qquad = 0$$
$$3x + 2 = 0 \qquad x - 1 = 0$$
$$3x = -2 \qquad x = 1$$
$$x = -\tfrac{2}{3}$$

Only $-\tfrac{2}{3}$ is listed as an answer choice.

20. **d.** $B^2 + 8B + 12 = 0$ can be factored into two sets of parentheses: $(B \pm ?)(B \pm ?)$. Because the coefficient on the B^2 is 1, we know the missing numbers add to 8 (because the coefficient of B is 8) and multiply to 12 (the *lone number* is 12). Thus, the numbers are 6 and 2, and the equation is $(B + 6)(B + 2) = 0$. Solving for B, we get:

$$(B + 6) \qquad (B + 2) \qquad = 0$$
$$B+6 = 0 \qquad B + 2 = 0$$
$$B = -6 \qquad B = -2$$

21. **a.** Take the given equation, $2x^3 + 8 = 62$, and subtract 8 from both sides to yield $2x^3 = 54$. Next, divide both sides by 2 to get $x^3 = 27$. $(x)(x)(x) = 27$, or $x = 3$.

22. **d.** Notice that all the answer choices are expressed as fractions. That's your clue that you need to find a common denominator for these terms. The denominators are 3, 10, and 5, so 30 would be a great common denominator. To turn $\tfrac{x}{3}$ into something over 30, you are multiplying top and bottom by 10. This first term becomes $\tfrac{10x}{30}$. Now look at the second term, $\tfrac{3x}{10}$. To turn this term into something over 30, you'll multiply top and bottom by 3, yielding $\tfrac{9x}{30}$. Next, to turn $\tfrac{2x}{5}$ into something over 30, multiply top and bottom by 6, and

you get $\tfrac{12x}{30}$. The original expression $(\tfrac{x}{3}) + (\tfrac{3x}{10}) - (\tfrac{2x}{5})$ is now $(\tfrac{10x}{30}) + (\tfrac{9x}{30}) - (\tfrac{12x}{30}) = \tfrac{7x}{30}$.

23. **c.** Starting with $2x - y = 4$ and $x + y = 8$, rewrite them as $2x - 4 = y$ and $8 - y = x$. Substitute the first expression into the second: $8 - 2(2x - 4) = x$ and solve for x; this yields $12 = 3x$ or $4 = x$.

24. **a.** Substituting $x = 3$ and $y = -2$ into the equation $5x^2 + 2xy^3$ we get: $5(3)^2 + 2(3)(-2)^3 = (5)(9) + (2)(3)(-8) = 45 + (6)(-8) = 45 + (-48) = -3$.

25. **c.** When you substitute $a = 2, b = -1,$ and $c = \tfrac{1}{2}$, into the expression

$$\tfrac{2a - b + 5}{c}$$

you get:

$$\tfrac{2(2) - (-1) + 5}{\tfrac{1}{2}}$$

which simplifies to:

$$\tfrac{4 + 1 + 5}{\tfrac{1}{2}}$$

which equals:

$$\tfrac{10}{\tfrac{1}{2}}$$

10 divided by $\tfrac{1}{2}$ is the same thing as 10 times 2, which equals 20.

5

PRACTICE TESTS IN GRAMMAR, WRITING, AND READING COMPREHENSION

SUMMARY

This chapter gives you the chance to apply what you have learned. Included are practice tests in grammar, writing, and reading comprehension. As you complete the sections, you should be able to find your strengths and weaknesses.

PRACTICE GRAMMAR TEST

AGREEMENT

There is an agreement error in each of the following sentences. Mark an **SV** to the left of the sentence if there is a subject/verb error. Mark a **PA** to the left if there is a pronoun/antecedent error. Then try rewriting the sentence correctly.

_____ **1.** It is unacceptable to clone a child because they would be treated as second class and not as a traditional being.

_____

_____

_____ **2.** By euthanizing terminally ill patients, doctors will be relieved of the time they spend treating these patients, and he or she will have more time to spend with patients they can really cure.

_____

_____

_____ **3.** Many incidents of condensed air pollution has killed or hospitalized hundreds of people at a time.

_____

_____

_____ **4.** The principle of the issue is still over legalizing the right to help someone end their life.

_____

_____

_____ **5.** The author's focal point throughout his arguments are that human cloning would diminish family relationships.

_____

_____

_____ **6.** In conclusion, air and garbage pollution is a real problem for Americans.

_____

_____

_____ **7.** The list of candidates for graduation include my name and my brother's.

_____

_____

_____ **8.** My books and my calculator remains in the test room.

_____

_____

_____ **9.** Her problem are migraine headaches.

_____

_____

_____ **10.** Each of the episodes on _ER_ and _NYPD Blue_ is exciting.

_____

_____

SENTENCE STRUCTURE

There is a sentence fragment, fused sentence, or comma splice error in each sentence below. First, mark an **SF** for sentence fragment, a **FS** for fused sentence, or a **CS** for comma splice to the left of the sentence. Then rewrite the sentence correctly.

_____ **1.** The two-car family is common these days everyone wants an SUV and a sedan.

_____

_____

_____ **2.** Roses are not difficult to grow, they just need to be fed and pruned regularly.

_____

_____

_____ **3.** California often endures brush fires that are hard to put out, some have been burning for years.

_____

_____

_____ **4.** Some villagers had never seen an automobile. Only knowing bicycles as a means of transportation.

_____

_____

_____ **5.** Environmentalists fear that once the Alaska oil fields are opened for exploration, wilderness will be destroyed. With no guarantees that our energy crisis will have been helped in the process.

_____

_____

_____ **6.** Recent census figures indicate that there has been a dramatic increase in the number of men who are single parenting their children, the mothers gave up custody during the divorce proceedings.

_____

_____

_____ **7.** Human cloning is just years if not months away do we fully understand the social consequences of our research?

_____

_____

_____ **8.** Testing cosmetics by using helpless animals is cruel, there should be laws to protect against such abuse.

_____

_____

_____ **9.** Weather maps, graphs, charts, tables. All are confusing to read.

_____

_____

_____ **10.** Hurricanes are dangerous storms costing thousands of dollars to homeowners in repair costs each year, Congress should pass more laws to help citizens in crises such as these.

_____

_____

HOMONYM ERRORS

Some of the sentences below are correct and some have homonym errors. The homonym in each sentence is underlined. Remember that homonyms are words that sound alike but are spelled differently and mean different things. Put a **C** to the left of the correct sentence and an **X** next to the incorrect sentence. If the homonym is incorrect, write it correctly on the line that follows the sentence.

_____ **1.** The <u>affects</u> of the tornadoes can be devastating.

_____

_____ **2.** The <u>principal</u> of the mortgage remains almost constant as the interest is paid off.

_____

_____ **3.** A college education has <u>it's</u> rewards, best of which is higher earning capacity.

_____

_____ **4.** Why <u>there</u> are so few candidates to replace the president is a mystery to everyone.

_____

_____ **5.** He explained that he had been <u>excepted</u> at two other schools.

_____

_____ **6.** It was the <u>patience</u> that worried the most about the hospital blackout.

_____

_____ **7.** The Gobi <u>desert</u> is in Africa.

_____

_____ **8.** The angle of <u>descent</u> determines the air speed.

_____

_____ **9.** Inclement <u>whether</u> conditions caused our delay.

_____

_____ **10.** He had been <u>dyeing</u> for months, and when the end came he was grateful.

_____

SEMICOLONS

The following paragraph has errors in semicolons. The sentences have been numbered for you. Number down 1–10 on a separate sheet of paper and mark a **C** if the sentence is correct. If it is incorrect, identify the error and rewrite the sentence correctly. Remember that there may be more than one way to correct a sentence error.

(1) In an editorial that ran during the Clinton scandal, the *New York Times* called for censure rather than impeachment. (2) Although it never did explain why censure was better than impeachment; in fact, the editorial gave many reasons why censure was good; but it never addressed why impeachment was bad. (3) One can only assume that if censure was preferable one reason had to be because impeachment would have seriously harmed the reputation of the United States abroad; weakening our position as a world leader. (4) Who in the world would care if the President of the United States engaged in, " . . . deceitful and dishonest conduct that was grossly inconsistent with his constitutional obligations and sacred duty" is a

mystery to most Americans; however, if the *New York Times* implied it, it must be true.

(5) What everyone should have been more concerned with was that the actions of the former president landed many of his friends and colleagues in court or in jail; costing them millions in legal fees. (6) This may not have been grounds for impeachment; censure, however, was too mild a punishment. (7) What the *New York Times* should have called for was that the president and his wife would have been held responsible for all legal costs incurred by anyone brought to court because of their actions; with no limit set on the dollar amount. (8) As it is, the former president walked out of office unscathed; the first lady was elected to the Senate! (9) So much for the *New York Times* and censure. (10) The Clintons left office both uncensured and unimpeached; their reputations only slightly blemished.

PRACTICE WRITING TEST

Often, colleges have varied kinds of essay prompts for their placement tests. This practice essay requires that you read a passage and then respond in writing. By asking you to read something, you are being given some direction for your writing. This could cut down on your prewriting time. Allow yourself a minimum of one hour to respond to the essay prompt below. Many schools allow one hour, others allow two.

Read the following narrative about an afternoon of work shared by a son and his father.

So, for hours my dad and I worked. We cleared out and sorted all the junk, ripped down the cardboard that made the walls, stopped to stare, to think, came up with opposite plans, argued, convinced each other, then having switched sides, we argued again. Finally, we jacked up the north side of the garage, replaced the sill, dropped a corner post in cement, took the jack away, rebuilt the well. Next, we shored up the metal roof over the leaky old asphalt shingles. We hit our heads and cut our fingers and ripped our jackets. We argued, mostly about techniques but, really, I guess, about who was in charge of the work.

That evening my dad said, "You have good hands." That little compliment was everything. I glowed. I told my friends, my folks, my girlfriend. I stared at my hands late at night and to this day when I pull the car into the garage I think of my Dad and that hot day in August when we worked together.

Directions: Write a 500-word essay which tells the story of a brief episode in your experience when you learned something about yourself or felt proud of an accomplishment. Be sure your essay includes an introduction, development and conclusion that:

- describes the time, place and people of your story
- details the action leading up to the accomplishment
- develops the importance of the accomplishment
- follows the conventions of standard written English

Once you have completed your essay, use the rubric or grading scale on page 23 to help you judge it. You might try asking someone to help you judge your own work; we tend not to see our own errors.

PRACTICE READING COMPREHENSION TEST

Following are two reading comprehension passages. Try applying the strategies learned in Chapter 3.

PASSAGE ONE

This first passage is nonfiction, something you might find in a textbook. Remember to read for main idea, organization, and vocabulary in context. Read the passage through and then go back and read a paragraph at a time. Note that the paragraphs have been numbered 1–4 to assist you.

The atmosphere forms a gaseous, protective envelope around Earth. It protects the Earth from the cold of space, from harmful ultraviolet light, and from all but the largest meteors. After traveling over 93 million miles, solar energy strikes the atmosphere and Earth's surface, warming the planet and creating what is known as the "biosphere," which is the region of Earth capable of sustaining life. Solar radiation, in combination with the planet's rotation, causes the atmosphere to circulate. Atmospheric circulation is one important reason that life on Earth can exist at higher latitudes because equatorial heat is transported poleward, moderating the climate.

(2)The equatorial region is the warmest part of the earth because it receives the most direct and therefore strongest solar radiation. The plane in which the earth revolves around the sun is called the ecliptic. The Earth's axis is inclined $23\frac{1}{2}$ degrees with respect to the ecliptic. This inclined axis is responsible for our changing seasons because, as seen from the Earth, the sun oscillates back and forth across the equator in an annual cycle. About June 21 each year, the sun reaches the Tropic of Cancer, $23\frac{1}{2}$ degrees north latitude. This is the northernmost point where the sun can be directly overhead. About December 21 of each year the sun reaches the Tropic of Capricorn, $23\frac{1}{2}$ degrees south latitude. This is the southernmost point at which the sun can be directly overhead. The solar regions are the coldest parts of the Earth because they receive the least direct and therefore the weakest solar radiation. Here solar radiation strikes at an oblique angle and thus spreads the same amount of energy over a greater area than in the equatorial regions. A static envelope of air surrounding the Earth would produce an extremely hot, uninhabitable equatorial region while the polar region would remain inhospitably cold.

(3)The transport of water vapor in the atmosphere is an important mechanism in which heat energy is redistributed poleward. When water evaporates into the air and becomes water vapor, it absorbs energy. At the equator, water vapor-saturated air rises high into the atmosphere where winds aloft carry it poleward. As this moist air approaches the polar regions, it cools and sinks back to Earth. At some point the water vapor condenses out of the air as rain or snow, releasing energy in the process. The now dry polar air flows back toward the equator to repeat the convection cycle. In this way, heat energy absorbed at the equator is deposited at the poles and the temperature gradient between these regions is reduced.

(4)The circulation of the atmosphere and the weather it generates is but one example of the

many complex, interdependent events of nature. The web of life depends on the proper functioning of these natural mechanisms for its continued existence. Global warming, the hole in the atmosphere's ozone layer, and increasing air and water pollution pose serious, long term threats to the biosphere. Given the high degree of nature's interconnectedness, it is quite possible that the most serious threats have yet to be recognized.

1. Which of the following best expresses the main idea of the passage?
   a. The circulation of atmosphere—now threatened by global warming, the hole in the ozone layer, and pollution—protects the biosphere and makes life on Earth possible.
   b. If the protective atmosphere around the Earth is too damaged by human activity, all life on Earth will cease.
   c. Life on Earth is the result of complex interdependent events of nature, events that reflect harmful human activity and interference.
   d. The circulation of atmosphere is the single most important factor in keeping the biosphere alive, and it is constantly threatened by harmful human activity.

2. Which of the following is the best definition of "biosphere" as used in the passage?
   a. the protective envelope formed by the atmosphere around the living Earth
   b. that part of the Earth and its atmosphere in which life can exist
   c. the living things on Earth whose existence is made possible by circulation of the atmosphere

   d. the circulation of the atmosphere's contribution to life on Earth

3. Which of the following sentences from the passage best supports the author's point that circulation of the atmosphere is vital to life on Earth?
   a. The equatorial region is the warmest part of the Earth because it receives the most direct and therefore strongest solar radiation.
   b. The circulation of the atmosphere and the weather it generates is but one example of the many complex, interdependent events of nature.
   c. The atmosphere protects Earth from the cold of space, from harmful ultraviolet light, and from all but the largest meteors.
   d. A static envelope of air surrounding the Earth would produce an uninhabitable hot equatorial region while the polar regions would remain inhospitably cold.

4. Based on the passage, which of the following is directly responsible for all temperature changes on Earth?
   a. variations in the strength of solar radiation
   b. variations in the amount of ultraviolet light
   c. variations of biologic processes in the biosphere
   d. variations in global warming

5. The first paragraph of the passage deals mainly with which of the following effects of the atmosphere on the Earth?
   a. its sheltering effect
   b. its reviving effect
   c. its invigorating effect

d. its cleansing effect

PASSAGE TWO

Now try practicing your inference skills on this longer excerpted passage from a work of fiction. Again, the paragraphs have been numbered to assist you.

(1)For perhaps the tenth time since the clock struck two, Sylvia crosses to the front-facing window of her apartment, pulls back the blue curtain and looks down the street. People hurry along the sidewalk. Although she watches for several long moments, she sees no one enter her building.

(2)She walks back to the center of the high-ceilinged living room, where she stands frowning and twisting a silver bracelet around and around on her wrist. She is an attractive young woman, although perhaps too thin and with a look that is faintly ascetic; her face is narrow and delicate, her fine, light-brown hair caught back by a tortoiseshell comb. She is restless now, because she is being kept waiting. It is nearly two-thirty and a woman named Lola Parrish was to come at two o'clock to look at the apartment.

(3)She considers leaving a note and going out. The woman is late, and Sylvia is certain that Lola Parrish will not be a suitable person with whom to share the apartment. On the phone she had sounded too old, for one thing, her voice oddly flat and as deep as a man's. However, the moment for saying the apartment was no longer available slipped past, and Sylvia found herself agreeing to the two o'clock appointment. If she leaves now, as she has a perfect right to do, she can avoid the awkwardness of turning the woman away.

(4)Looking past the blue curtain, however, she sees the sky is not clear but veiled by a white haze, and the air is oppressively still. She knows that the haze and stillness and heat are conditions that often precede a summer thunderstorm, one of the abrupt, electrical storms that have terrified her since she was a child. If a storm comes, she wants to be at home in her own place.

(5)She walks back to the center of the room, aware now that the idea of sharing the apartment has actually begun to repel her. Still, she knows she will have to become accustomed to the notion. Her savings are nearly gone, and the small trust fund left her by her father exhausted. She has a job, but it does not pay well, and although she has considered seeking another (perhaps something connected with music—in her childhood she had played the flute and people had said she was gifted), lately she has found herself dragged down by a strange inertia.

(6)Besides, although her job pays poorly, it suits her. She is a typist in a natural history museum, in an office on the top floor, near the aviary. The man for whom she works, one of the curators, is rarely in, so Sylvia has the office to herself. The aviary consists of three enormous rooms, painted white, each with a high vaulted ceiling. The birds, so beautifully mounted, seem alive in their elaborate dioramas. Behind glass, they perch in trees with leaves of sculpted metal, and appear to soar through painted forests, rivers, and marshes. Everything is rendered in exquisite detail. And in her office, there is a skylight. The location of the office, so near the open sky,

suits her, too, because she is mildly claustrophobic.

1. Which of the following adjectives best describes Sylvia's mood as depicted in the story?
   a. anxious
   b. angry
   c. meditative
   d. serene

2. Based on the tone of the passage and the description of Sylvia at this moment, which of the following is the most likely reason Sylvia's job "suits her?"
   a. Her office is tastefully decorated.
   b. She is fond of her employer, the museum curator.
   c. She is musical and enjoys the singing of birds.
   d. She is able to work alone in a space that feels open.

3. When Sylvia looks out her window, the weather appears
   a. gloomy.
   b. ominous.
   c. spring-like.
   d. bracing.

4. Based on the story segment, which of the following would most likely describe Sylvia's behavior in relationship to other people?
   a. distant
   b. overbearing
   c. dependent
   d. malicious

5. Which of the following is most likely the author's purpose in describing the museum where Sylvia works?
   a. Everything in it, though beautiful and tasteful, seems frozen or removed from life and reflects some aspect of Sylvia's character.
   b. The fact that it is light and airy and filled with beautiful dioramas reflects Sylvia's youth and her wish for something better.
   c. Some part of the story, perhaps a love affair between Sylvia and her boss, will probably take place there.
   d. The killing and mounting of the beautiful birds will probably play an important part in the story.

ANSWER KEY FOR PRACTICE TESTS

AGREEMENT

1. PA
   Clone requires a singular pronoun, *he/she*.
   It is unacceptable to clone a child because he or she would be treated as a second-class citizen.

2. PA
   Doctors requires a plural pronoun, *they*.
   By euthanizing terminally ill patients, doctors will be relieved of the time they spend treating these patients, and they will have time to spend with a patient who is treatable.

3. SV
   Incidents requires the plural form of the verb, *have*.
   Many incidents of condensed air pollution have killed or hospitalized hundreds of people at a time.

4. PA

Someone requires the singular pronoun *his/her*. The principle of the issue is still over helping someone end his or her life.

5. SV

Focal point is the subject of the sentence and requires the singular verb *is*.

The author's focal point throughout his arguments is that human cloning would diminish family relationships.

6. SV

Air and garbage pollution is a compound subject and requires the plural verb *are*. In addition, once you change the verb to plural, you must change *a problem* to the plural *problems* as well.

In conclusion, air and garbage pollution are real problems for Americans.

7. SV

List is a singular subject and requires the singular verb *includes*.

The list of candidates for graduation includes my name and my brother's.

8. SV

Books and calculator require the plural verb *remain*.

My books and my calculator remain in the test room.

9. SV

Her problem is the subject and it requires the singular verb *is*.

Her problem is migraine headaches.

10. SV

Each is singular and requires the singular verb *is*.

Each of the episodes on *ER* and *NYPD Blue* is exciting.

SENTENCE STRUCTURE: COMMA SPLICES, FUSED SENTENCES, AND SENTENCE FRAGMENTS

1. SF

The two-car family is common these days. Everyone wants an SUV and a sedan.

Or

The two-car family is common these days; everyone wants an SUV and a sedan.

2. CS

Roses are not difficult to grow. They just need to be fed and pruned regularly.

Or

Roses are not difficult to grow; they just need to be fed and pruned regularly.

3. CS

California often endures brush fires that are hard to put out. Some have been burning for years.

Or

California often endures brush fires that are hard to put out; some have been burning for years.

4. SF

The sentence fragment is "Only knowing bicycles as a means of transportation." It must be connected to the sentence that comes before or after it. Or it could be made into a sentence of its own.

Some villagers had never seen an automobile because they had only known bicycles as a means of transportation.

Or

Some villagers had never seen an automobile. They had only known bicycles as a means of transportation.

5. SF

The sentence fragment is "With no guarantees that our energy crisis will have been helped in the process." It must be connected to the sentence that comes before or after it, or it has to be made into a sentence.

Environmentalists fear that once the Alaska oil fields are opened for exploration, wilderness will be destroyed, and there will be no guarantees that our energy crisis will have been helped in the process.

Or

Environmentalists fear that once the Alaska oil fields are opened for exploration, wilderness will be destroyed. There will be no guarantees that our energy crisis will have been helped in the process.

6. CS

Recent census figures indicate that there has been a dramatic increase in the number of men who are single parenting their children. The mothers gave up custody in the divorce proceedings.

Or

Recent census figures indicate that there has been a dramatic increase in the number of men who are single parenting their children; the mothers gave up custody in the divorce proceedings.

Or

Recent census figures indicate that there has been a dramatic increase in the number of men who are single parenting their children because the mothers gave up custody in the divorce proceedings.

7. FS

Human cloning is just years if not months away. Do we fully understand the social consequences of our research?

8. CS

Testing cosmetics by using helpless animals is cruel. There should be laws to protect against such abuse.

Or

Testing cosmetics using helpless animals is cruel, and there should be laws to protect against such abuse.

Or

Testing cosmetics using helpless animals is cruel; there should be laws to protect against such abuse.

9. SF

The sentence fragment is "Weather maps, graphs, charts, tables." It should be connected to the sentence that follows it.

Weather maps, graphs, charts, and tables are all confusing to read.

10. CS

Hurricanes are dangerous storms costing thousands of dollars to homeowners in repair costs each year. Congress should . . .

Or

Hurricanes are dangerous storms costing thousands of dollars to homeowners in repair costs each year; therefore, Congress should . . .

HOMONYM ERRORS

1. X   effects

2. **Correct**

3. X   its

4. **Correct**

5. X   accepted

6. X   patients

7. **Correct**

8. **Correct**

9. X   weather

10. X   dying

SEMICOLONS

1. Correct

2. The first part of sentence two is an incomplete sentence and cannot be connected to the rest of the sentence with a semicolon. It must either be rewritten as a complete sentence or rewritten so that it connects to the sentence that precedes it. One possible correction:

   In an editorial that ran during the Clinton scandal, the *New York Times* called for censure rather than impeachment, although it never did explain why censure was better than impeachment.

3. In this sentence the last clause following the semicolon is not a complete sentence and cannot be connected to the sentence before it without a word to link them. A possible connection and therefore a correction would be to insert "therefore" instead of the semicolon.

4. Correct

5. In this sentence the last clause following the semicolon is not a complete sentence and cannot be connected to the sentence before it without a word to link them. By inserting "which cost them" would be one way to eliminate the semicolon and create a complete sentence.

6. Correct

7. In this sentence the last clause following the semicolon is not a complete sentence and cannot be connected to the sentence before it without a word to link them. In this case, replacing the semicolon with a comma would be acceptable.

8. Correct

9. Correct

10. Correct

READING COMPREHENSION
PASSAGE ONE

1. **a.** Choice **b** emphasizes only damage to the atmosphere; the passage encompasses more than that. Choice **c** does not mention the atmosphere, which is the main focus of the passage. Choice **d** is too narrow—the final paragraph of the passage emphasizes that the circulation of the atmosphere is but one example of the complex events that keeps the Earth alive.

2. **b.** The *biosphere,* as defined in the first paragraph, is a *region* (or part) of the Earth; it is not the envelope around the Earth, the living things on Earth, or the circulation of the atmosphere (choices **a, c, d**).

3. **d.** This question assesses the ability to recognize supported and unsupported claims. Choice **a** deals with solar radiation, not with circulation of the atmosphere. Choice **b** is an assertion without specific supporting detail. Choice **c** describes how the atmosphere protects Earth but does not speak of the circulation of the atmosphere. Only choice **d** explains that conditions would be unlivable at the equator and poles without the circulation of the atmosphere; therefore, it is the best choice.

4. **a.** This question assesses the ability to see cause-and-effect. The second paragraph deals with how a variation in the strength with which solar radiation strikes the Earth affects temperature. None of the other choices is discussed in terms of all temperature changes on Earth.

5. **a.** There is no mention in the first paragraph of any *reviving* or *cleansing* effect the atmosphere may have (choices **b** and **d**). In a sense, enabling the Earth to sustain life is invigorating; however, choice **a** is a better choice because the first two sentences talk about how the atmosphere protects the Earth from harmful forces.

PASSAGE TWO

1. **a.** In paragraph 2, Sylvia is described as restless, and in paragraph 4 she is fearful of the impending storm; therefore her mood is most likely anxious. Choice **b** is wrong because there are no details that would indicate anger. Choices **c** and **d** are refuted because of her obvious dread of the coming storm.

2. **d.** Choices **a** and **b** may be true but are not reflected in the story. Choice **c** is wrong because the birds that surround Sylvia at work are dead, mounted, and cannot be singing. In the final sentence, Sylvia is described as *mildly claustrophobic*, so the best answer is **d,** which states that she works in a space that feels open.

3. **b.** In paragraph 4, Sylvia does not want to go outside because an electrical storm is coming, and she has always been terrified of storms. Choice **a** is wrong because the adjective gloomy (choice **a**) doesn't connote the threat of a frightening electrical storm. Since Sylvia is afraid of the weather, such cheery adjectives as *spring-like* or *bracing* (choices **c** and **d**) cannot be said to describe it.

4. **a.** Sylvia's job suits her partly because her boss is usually gone and she's alone at work. She is mildly fearful of meeting the new person, Lola Parrish and even thinks of leaving before their appointment. These details point to a distant kind of person, the opposite of someone who might be overbearing or malicious (choices **b** and **d**). She seems to want to be alone and so is unlikely to be dependent on others (choice **c**).

5. **a.** Sylvia does seem distant and her life somewhat cold, so choice **a** is the most logical choice. The details in the story segment do not connote lightness or airiness (she's restless and fearful; the weather is threatening), so choice **b** isn't logical. There is no hint in the story segment that Sylvia feels anything about her boss, nor is there anything in this scene to remind us of the actual killing of the birds in the museum (choices **c** and **d**).

C · H · A · P · T · E · R

PRACTICE TESTS IN ARITHMETIC, ALGEBRA, AND GEOMETRY

6

SUMMARY

Now you can apply the math skills that you have learned in this book. You can use this practice test to help you identify your strengths and weaknesses and see where you might need some more practice to get your math skills in shape for college.

PRACTICE ARITHMETIC TEST

Directions: Circle the correct answer to the following problems. You can check your answers at the end of the chapter

1. After she started exercising, Patty started losing weight at a steady rate. She lost 24 pounds in one year. How much weight did Patty lose per month?
   a. 2 pounds
   b. 1 pound
   c. 3 pounds
   d. 12 pounds

2. At her party, Mackenzie put out a bowl containing 360 jellybeans. Marina came by and ate $\frac{1}{12}$ of the jellybeans, Christina ate $\frac{1}{4}$, Athena ate $\frac{1}{5}$, and Jade ate $\frac{1}{8}$. How many jellybeans were left?
   a. 120
   b. 240
   c. 237
   d. 123

3. At DeCavallas Home Improvements, industrial cable sells for $4.98 per yard. If Gina needs to purchase 108 feet of cable, how much will this cost her?
   a. $179.28
   b. $537.84
   c. $18.02
   d. $268.92

4. If it takes 5 workers to build 3 sheds, how many would it take to build 18?
   a. 90
   b. 18
   c. 15
   d. 30

5. Change 0.525 to a percent.
   a. 525%
   b. 5.25%
   c. 0.525%
   d. 52.5%

6. What is $|-423| + |423|$ equal to?
   a. 0
   b. $-|423|$
   c. 846
   d. 423

7. What is $(4 + 2)^3$?
   a. 196
   b. 72
   c. 216
   d. 18

8. What does 8.2×10^9 equal?
   a. 8,200,000,000
   b. 820,000,000
   c. 820,000
   d. 820,000,000,000

9. Calculate $\sqrt{(97 - 16)}$ multiplied by $\sqrt{(48 \div 3)}$.
   a. $\sqrt{36}$
   b. 9
   c. 6^2
   d. 4

10. What is the median of the following group of numbers? 10 20 30 40 50 60
    a. 30
    b. 35
    c. 60
    d. 40

11. The average weight of a male Proboscis monkey, *Nasalis larvatus*, is 20,370 grams. The average weight of a male Douc langer, *Pygathria nemaeus*, is 10,900 grams. How much bigger is the average male Proboscis monkey than the average male Douc langer?
  a. 10,430 grams
  b. 8,980 grams
  c. 9,470 grams
  d. 10,470 grams

PRACTICE ALGEBRA AND GEOMETRY TEST

Directions: Circle the correct answer to the following problems. You can check your answers at the end of the chapter.

12. If $V = \pi r^2 h$, what is h equal to?
  a. $\frac{\pi V}{r^2}$
  b. $V\pi r^2$
  c. $\frac{V}{\pi r^2}$
  d. $\frac{Vh}{r^2}$

13. Factoring $2pq^2 - 4p^2q^3$ yields which of the following expressions?
  a. $2pq(q - 2pq^2)$
  b. $2pq(q - 2pq)$
  c. $2p^2q(q - 2pq^2)$
  d. $2pq(q - 4pq^2)$

14. $(3x^4y^2)(5xy^3)$ is equivalent to
  a. $15x^4y^5$
  b. $15x^5y^4$
  c. $15x^5y^5$
  d. $15x^4y^4$

15. If x is a positive integer, solve for x: $3x + x^2 = 28$
  a. 4
  b. -4
  c. -7
  d. a and c

16. What is the value of $3x^2 - 2xy^3$ when $x = 1$ and $y = -2$?
  a. -19
  b. -5
  c. 13
  d. 19

17. $\frac{x}{4} - \frac{2x}{3} + \frac{5x}{6} =$
  a. $\frac{2x}{12}$
  b. $\frac{5x}{12}$
  c. $\frac{4x}{6}$
  d. $\frac{22x}{6}$

18. If $\underline{BC}$ is parallel to $\underline{DE}$, and $\underline{DB} = 6$, what is the value of $\underline{AE}$?
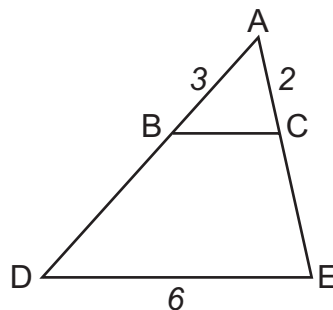
  a. 4
  b. 6
  c. 8
  d. 10

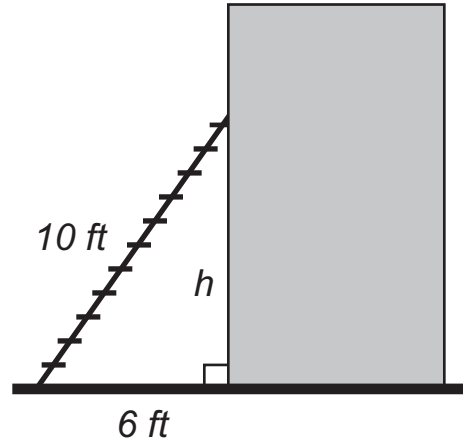**19.** Circle O has a diameter of 8 cm. What is the area of Circle O?
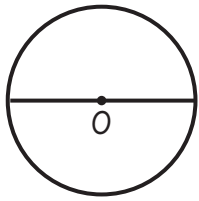
a. 64π cm^2
b. 32π cm^2
c. 16π cm^2
d. 8π cm^2

**20.** What is the perimeter of the rectangle shown below?

$2 - a$

a
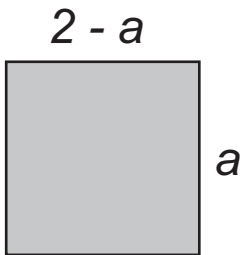
a. $(2 - a)^2$
b. $(2 - a)(a)^2$
c. $4 + 8a$
d. 4

21. If a 10 ft ladder is leaning against a building as shown in the diagram below, how many feet above the ground, h, is the top of the ladder?
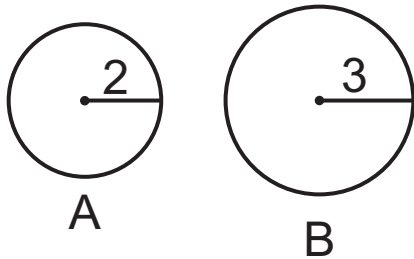

10 ft

h

6 ft

a. 8
b. 10
c. $\sqrt{8}$
d. $\sqrt{10}$

22. The graph of $y = 3x - 12$ crosses the x-axis at which of the following coordinates?
a. $(-4, 0)$
b. $(4, 0)$
c. $(0, 4)$
d. $(0, -4)$

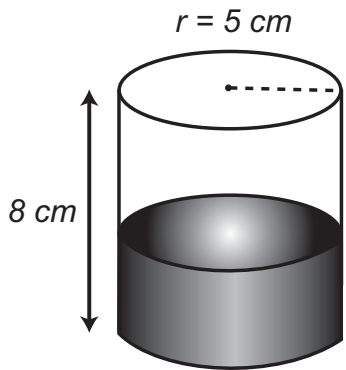**23.** If the side of the cube below is doubled, what happens to its volume?

2
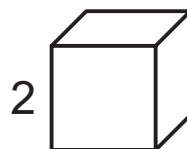
a. It is doubled.
b. It is tripled.
c. It is quadrupled.
d. It is multiplied by eight.

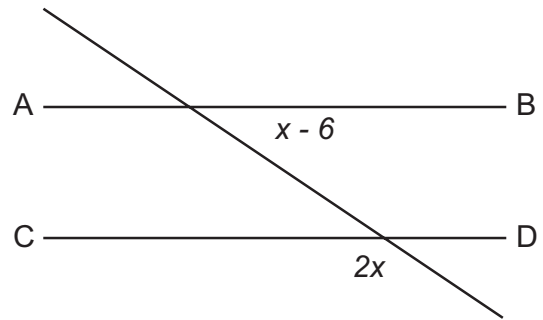**24.** How much greater is the area of Circle B than the area of Circle A?

a. 5π cm²
b. 12π cm²
c. 20π cm²
d. 36π cm²

25. If $r = 5$ cm and the water is 4 cm high, what is the volume of water in the right cylinder below?

$r = 5$ cm

8 cm

a. 20π cm³
b. 80π cm³
c. 100π cm³
d. 800π cm³

26. If line segment $\overline{AB}$ is parallel to line segment $\overline{CD}$, what is the value of x?

a. 58°
b. 62°
c. 56°
d. 60°

27. A line has a slope $= \frac{3}{2}$ and passes through the points $(1, q)$ and $(-5, -6)$. What is the value of q?

a. 3
b. 1
c. -3
d. -1

28. How many times does the graph $x^2 - 81 = y$ cross the x-axis?

a. not at all
b. once
c. twice
d. three times

29. Which inequality below is equivalent to $8x - 3 > 29$?

a. $-4 < x > 4$
b. $x < 4$
c. $x > 4$
d. $-4 < x$

30. Alan is 5 years less than twice Helena's age. If Alan is 27, then which equation can be used to solve for Helena's age?

   a. $22 = 2H$

   b. $27 = H - 5$

   c. $22 = 2H + 5$

   d. $27 = 2H - 5$

ANSWERS

PRACTICE ARITHMETIC TEST

1. a. There are 12 months in one year, so $24 \div 12 = 2$ pounds per month.

2. d. Marina ate $\frac{1}{12}$ of 360: $\frac{1}{12} \times \frac{360}{1} = \frac{360}{12}$, which is equal to 30. Christina ate $\frac{1}{4}$ of 360: $\frac{1}{4} \times \frac{360}{1} = \frac{360}{4}$, which is equal to 90. Athena ate $\frac{1}{5}$ of 360: $\frac{1}{5} \times \frac{360}{1} = \frac{360}{5}$, which is equal to 72. Finally, Jade ate $\frac{1}{8}$ of 360: $\frac{1}{8} \times \frac{360}{1} = \frac{360}{8}$ which is equal to 45. Add them all up: $30 + 90 + 72 + 45 = 237$. Then subtract that from the original amount: $360 - 237 = 123$.

3. a. First convert 108 feet into yards. Since there are 3 feet in one yard, divide 108 by 3: $108 \div 3 = 36$. Then multiply your answer by $4.98 to get $179.28. If you chose answer **b**, you forgot to convert the feet into yards.

4. d. First set up a proportion: $\frac{5}{3} = \frac{x}{18}$. Then cross multiply: $3x = 18 \times 5$. Then solve for your answer: $3x = 90$, so $x = 30$.

5. d. First, move the decimal point two digits to the right: .525 becomes 52.5. Next, add a percent sign: 52.5%.

6. c. $|-423| = 423, |423| = 423$, so add the two numbers together to get 846.

7. c. Calculate what is in the parentheses first: $4 + 2 = 6$, and then find the value of 6^3, which is 216.

8. a. Count nine spaces to the right of the decimal, so it becomes 8,200,000,000.

9. c. First calculate $\sqrt{(97 - 16)} = \sqrt{81} = 9$. Next, figure out $\sqrt{(48 \div 3)} = \sqrt{16} = 4$. Lastly, you multiply: $9 \times 4 = 36$. Since $6^2 = 36$, the answer is **c**.

10. b. Since there are two *middle numbers* in this set—30 and 40—the median is the average of the two, or 35.

11. c. This is a subtraction problem: $20{,}370 - 10{,}900 = 9{,}470$.

PRACTICE ALGEBRA AND GEOMETRY TEST

12. c. You need to rearrange the equation $V = \pi r^2 h$, into an equation that has h equal to something. In order to isolate the h, you need to get rid of the πr^2 on the right side of the equation. You can do this by dividing both sides by πr^2. Thus, the equation becomes $\frac{V}{\pi r^2} = h$.

13. a. In order to factor the original expression, first note what the two terms have in common: You can pull out a 2, a p, and a q^2. You get: $2pq(q - 2pq^2)$. To check this, you can distribute the $2pq$ to yield the original expression, $2pq^2 - 4p^2q^3$.

14. c. $(3x^4y^2)(5xy^3)$ can first be changed to $15x^4y^2xy^3$. If you have the same base, when multiplying exponents, you just add the powers. Since x is the same as x^1, when you add the powers of the x terms you get $4 + 1$, or x^5. For the y terms, you add $2 + 3$ to get y^5. Thus, the final answer is $15x^5y^5$.

15. a. First, subtract the 28 from both sides of $3x + x^2 = 28$ to yield $3x + x^2 - 28 = 0$. We rearrange this to $x^2 + 3x - 28 = 0$. Next, you need to pick out two numbers that add to 3 (the coefficient of x) and multiply to -28 (the last term). The numbers that work are -4 and 7. These go inside the parentheses as follows: $(x - 4)(x + 7) = 0$. Now you solve two equations: $x - 4 = 0$ and $x + 7 = 0$. The solutions to these equations are $x = 4$ and $x = -7$. But be careful! The question tells us that x is a *positive integer*. This means that $x = 4$ ONLY.

16. d. Look at the equation $3x^2 - 2xy^3$ and put a 1 wherever you see an x and a -2 wherever you see a y. The equation becomes $3(1)^2 - 2(1)(-2)^3 = 3(1) - 2(1)(-8) = 3 - (-16) = 3 + 16 = 19$. There are two tricky parts to this question. First, notice that $(-2)^3 = -8$. Also, notice that when subtracting a negative number, you are really just adding a positive number: $3 - (-16) = 3 + 16 = 19$.

17. b. First, we need to find the least common denominator. The denominators are 4, 3, and 6, so 12 will be the least common denominator. Next, we convert all three terms into something over 12:

$$\frac{3x}{12} - \frac{8x}{12} + \frac{10x}{12} = \frac{-5x}{12} + \frac{10x}{12} = \frac{5x}{12}$$

18. b. Triangle ABC and triangle DAE are similar. This means that their sides will be in proportion. Side AB will be in proportion with side AD. On the figure we can see that AB = 3. We are given that DB = 6, so we know that AD = 9. Thus the triangles are in a 3:9 ratio, which reduces to a 1:3 ratio. This helps us because if AC = 2, then AE will be three times as long, or 6.

19. c. Use the area formula for a circle, $A = \pi r^2$. If $d = 8$, then $r = 4$. $A = \pi r^2$ becomes $A = \pi(4)^2 = \pi(16) = 16\pi$ cm^2.

20. d. The perimeter formula for a rectangle is P $= 2l + 2w$. Here the length is $2 - a$, and the width is a. Putting these values into our formula we get L = $2(2-a) + 2(a) = 4 - 4a + 4a = 4$.

21. a. The diagram shows a right triangle with a hypotenuse of 10 ft and one leg equal to 6 ft. If you know how to spot a 6-8-10 right triangle you are in luck, and you know that the other leg, h, is 8 ft. Otherwise, use the Pythagorean theorem: $a^2 + b^2 = c^2$. This formula becomes $6^2 + h^2 = 10^2$, or $36 + h^2 = 100$, or $h^2 = 64$. Thus $h = 8$.

22. b. The line will cross the x-axis when $y = 0$. So we take the equation $y = 3x - 12$ and stick 0 in for y. Thus, the equation becomes $0 = 3x - 12$. We add 12 to both sides to yield $12 = 3x$. Divide both sides by 3 to get $x = 4$. So the line crosses at the (x, y) coordinates $(4, 0)$.

23. d. The side of the original cube is 2, so its volume is $V =$ side$^3 = (2)^3 = 8$ units^3. When we double its side, the side $= 2 \times 2 = 4$. The new volume is $V = (4)^3 = 64$ units^3. When you compare the two volumes, you see that you multiply the old volume (8) by eight to get the new volume (64).

24. a. The area of a circle is $A = \pi r^2$. The area of Circle B is $\pi(3)^2$, or 9π. The area of Circle A is $\pi(2)^2$, or 4π. The difference in areas is $9\pi - 4\pi$, or 5π.

25. c. The volume formula for a cylinder is $V = \pi r^2 h$. We will substitute in 5 for r, and 4 for h. Make sure that you don't use 8 as the height. We want the volume of the *water*, not the volume of the cylinder! The equation $V = \pi r^2 h$ becomes $V = \pi(5)^2(4) = \pi(25)(4) = 100\pi$ cm^3.

26. b. The line that crosses both parallel lines will create the same angles about both lines. There is an angle marked "$x - 6$" under line segment AB, so we can mark an angle "$x - 6$" under line segment CD. Now, notice that $2x$ and $x - 6$ combine to make a straight line. Since a straight line is 180 degrees, we can write: $2x + (x - 6) = 180$, or $3x - 6 = 180$, or $3x = 186$, or $x = 62°$, answer choice **b**.

27. a. Here we need to use the slope formula, and put in the values of the given coordinates:

$$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{q - (-6)}{1 - (-5)}$$
$$= \frac{q + 6}{1 + 5}$$
$$= \frac{q + 6}{6}$$

We know that $m = \frac{3}{2}$, so $\frac{3}{2} = \frac{q + 6}{6}$

We cross multiply to get: $2(q+6) = 18$. Divide both sides by 2 to get: $q + 6 = 9$. Thus, $q = 3$.

28. **c.** The graph will cross at an (x, y) coordinate that has $y = 0$. This means we should take the equation $x^2 - 81 = y$ and set y equal to 0. The equation becomes $x^2 - 81 = 0$. Moving the 81 over, we get $x^2 = 81$. Thus $x = 9$ and -9. This means there are 2 points that are on the x-axis, namely $(9, 0)$ and $(-9, 0)$. Thus the graph of $x^2 - 81 = y$ crosses the x-axis twice.

29. **c.** First we will add 3 to both sides:

$$8x - 3 > 29$$
$$\underline{+3 \quad +3}$$
$$8x > 32$$

Next, we divide both sides by 8 to yield $x > 4$.

30. **d.** "Alan is 5 years less than twice Helena's age" can be written mathematically as $A = 2H - 5$. Because we are also told that Alan is 27, we know that $27 = 2H - 5$.