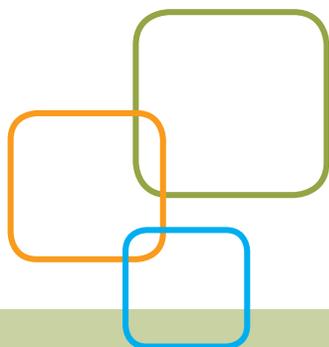


# ACCUPLACER®



## ACCUPLACER®

### Sample Questions for Students

To prepare for the placement test, please study the following sections:

Sentence Skills \_\_\_\_\_  
Reading Comprehension \_\_\_\_\_  
Arithmetic \_\_\_\_\_  
Elementary Algebra \_\_\_\_\_  
College-Level Mathematics \_\_\_\_\_

## Sentence Skills

In an ACCUPLACER® placement test, there are 20 Sentence Skills questions of two types.

- The first type is sentence correction questions that require an understanding of sentence structure. These questions ask you to choose the most appropriate word or phrase for the underlined portion of the sentence.
- The second type is construction shift questions. These questions ask that a sentence be rewritten according to the criteria shown while maintaining essentially the same meaning as the original sentence.

Within these two primary categories, the questions are also classified according to the skills being tested. Some questions deal with the logic of the sentence, others with whether or not the answer is a complete sentence, and still others with the relationship between coordination and subordination.

## Sentence Skills Sample Questions

### Directions for questions 1–12

Select the best version of the underlined part of the sentence. The first choice is the same as the original sentence. If you think the original sentence is best, choose the first answer.

1. Stamp collecting being a hobby that is sometimes used in the schools to teach economics and social studies.
  - A. being a hobby that is
  - B. is a hobby because it is
  - C. which is a hobby
  - D. is a hobby
2. Knocked sideways, the statue looked as if it would fall.
  - A. Knocked sideways, the statue looked
  - B. The statue was knocked sideways, looked
  - C. The statue looked knocked sideways
  - D. The statue, looking knocked sideways,
3. To walk, biking, and driving are Pat's favorite ways of getting around.
  - A. To walk, biking, and driving
  - B. Walking, biking, and driving
  - C. To walk, biking, and to drive
  - D. To walk, to bike, and also driving
4. When you cross the street in the middle of the block, this is an example of jaywalking.
  - A. When you cross the street in the middle of the block, this
  - B. You cross the street in the middle of the block, this
  - C. Crossing the street in the middle of the block
  - D. The fact that you cross the street in the middle of the block
5. Walking by the corner the other day, a child, I noticed, was watching for the light to change.
  - A. a child, I noticed, was watching
  - B. I noticed a child watching
  - C. a child was watching, I noticed,
  - D. there was, I noticed, a child watching
6. Going back to his old school, everything there looked smaller than Don remembered.
  - A. Going back to his old school,
  - B. When he went back to his old school,
  - C. To go back to his old school,
  - D. As he went back to his old school,
7. Painting, drawing and to sculpt are some of the techniques artists such as Picasso used to express themselves.
  - A. Painting, drawing and to sculpt
  - B. To paint, to draw, and sculpting
  - C. Painting, drawing and sculpting
  - D. To paint, draw, and sculpting
8. Playing sports in school which is an activity meant to teach teamwork and leadership skills students can use later in life.
  - A. which is an activity
  - B. is an activity because it is
  - C. being an activity which is
  - D. is an activity
9. Glancing at his watch, Daniel picked up his speed.
  - A. Glancing at his watch
  - B. He glanced at his watch and
  - C. To glance at his watch
  - D. Since he glanced at his watch
10. For a snake, shedding their skin up to eight times a year is part of a natural process.
  - A. For a snake, shedding their skin
  - B. A snake's shedding its skin
  - C. When a snake sheds its skin
  - D. To shed its skin, for snakes

11. To appear white or colorless, light is actually composed of an entire spectrum of colors.
- A. To appear white or colorless,
  - B. In appearing white or colorless,
  - C. As it appears white or colorless,
  - D. While it appears white or colorless,
12. I was surprised by the noise peering through the window to see who was at the door.
- A. I was surprised by the noise peering
  - B. I was surprised by the noise, peered
  - C. The noise surprised me, peering
  - D. Surprised by the noise, I peered

**Directions for questions 13–25**

*Rewrite the sentence in your head following the directions given below. Keep in mind that your new sentence should be well written and should have essentially the same meaning as the original sentence.*

13. It is easy to carry solid objects without spilling them, but the same cannot be said of liquids.

Rewrite, beginning with

Unlike liquids,

The next words will be

- A. it is easy to
  - B. we can easily
  - C. solid objects can easily be
  - D. solid objects are easy to be
14. Although the sandpiper is easily frightened by noise and light, it will bravely resist any force that threatens its nest.

Rewrite, beginning with

The sandpiper is easily frightened by noise and light,

The next words will be

- A. but it will bravely resist
  - B. nevertheless bravely resisting
  - C. and it will bravely resist
  - D. even if bravely resisting
15. If he had enough strength, Todd would move the boulder.

Rewrite, beginning with

Todd cannot move the boulder

The next words will be

- A. when lacking
- B. because he
- C. although there
- D. without enough

16. The band began to play, and then the real party started.

Rewrite, beginning with

The real party started

The next words will be

- A. after the band began
  - B. and the band began
  - C. although the band began
  - D. the band beginning
17. Chris heard no unusual noises when he listened in the park.

Rewrite, beginning with

Listening in the park,

The next words will be

- A. no unusual noises could be heard
  - B. then Chris heard no unusual noises
  - C. and hearing no unusual noises
  - D. Chris heard no unusual noises
18. It is unusual to see owls during the daytime, since they are nocturnal animals.

Rewrite, beginning with

Being nocturnal animals,

The next words will be

- A. it is unusual to see owls
  - B. owls are not usually seen
  - C. owls during the daytime are
  - D. it is during the daytime that
19. While bear attacks on humans are extremely rare, most occur when a mother bear's cubs are approached.

Rewrite, beginning with

Bear attacks on humans are extremely rare,

The next words will be

- A. but approaching a mother bear's cubs
- B. and approaching a mother bear's cubs
- C. even though approaching a mother bear's cubs
- D. nevertheless approaching a mother bear's cubs

20. If I want your opinion, I will ask for it.

Rewrite, beginning with

I won't ask for your opinion

The next words will be

- A. if I want it
- B. when I want it
- C. although I want it
- D. unless I want it

21. It began to rain, and everyone at the picnic ran to the trees to take shelter.

Rewrite, beginning with

Everyone at the picnic ran to take shelter

The next words will be

- A. beginning to rain
- B. when it began to rain
- C. although it began to rain
- D. and it began to rain

22. Lucy saw an amazing sight when she witnessed her first sunrise.

Rewrite, beginning with

Witnessing her first sunrise,

The next words will be

- A. an amazing sight was seen
- B. when Lucy saw an amazing sight
- C. Lucy saw an amazing sight
- D. seeing an amazing sight

23. After three hours of walking the museum, the entire family felt in need of a rest.

Rewrite, beginning with

The entire family felt in need of a rest

The next words will be

- A. walking through the museum for three hours
- B. having walked through the museum for three hours.
- C. and they walked through the museum for three hours
- D. despite having walked through the museum for three hours.

24. Bats see extremely well in the dark; in fact, much better than humans.

Rewrite, beginning with

Unlike bats,

The next words will be

- A. humans can see
- B. humans do not see
- C. it is not easy to see
- D. seeing is difficult

25. The big celebration meal was over, and everyone began to feel sleepy.

Rewrite, beginning with

Everyone began to feel sleepy

The next words will be

- A. and the big celebration meal
- B. before the big celebration meal
- C. after the big celebration meal
- D. although the big celebration meal

## Reading Comprehension

In an ACCUPLACER placement test, there are 20 questions of two primary types in Reading Comprehension.

- The first type of question consists of a reading passage followed by a question based on the text. Both short and long passages are provided. The reading passages can also be classified according to the kind of information processing required, including explicit statements related to the main idea, explicit statements related to a secondary idea, application, and inference.
- The second type of question, sentence relationships, presents two sentences followed by a question about the relationship between these two sentences. The question may ask, for example, if the statement in the second sentence supports that in the first, if it contradicts it, or if it repeats the same information.

## Reading Comprehension Sample Questions

*Read the statement or passage and then choose the best answer to the question. Answer the question based on what is stated or implied in the statement or passage.*

1. In the words of Thomas DeQuincey, “It is notorious that the memory strengthens as you lay burdens upon it.” If, like most people, you have trouble recalling the names of those you have just met, try this: The next time you are introduced, plan to remember the names. Say to yourself, “I’ll listen carefully; I’ll repeat each person’s name to be sure I’ve got it, and I will remember.” You’ll discover how effective this technique is and probably recall those names for the rest of your life.

The main idea of the paragraph maintains that the memory

- A. always operates at peak efficiency.
- B. breaks down under great strain.
- C. improves if it is used often.
- D. becomes unreliable if it tires.

2. Unemployment was the overriding fact of life when Franklin D. Roosevelt became president of the United States on March 4, 1933. An anomaly of the time was that the government did not systematically collect statistics of joblessness; actually it did not start doing so until 1940. The Bureau of Labor Statistics later estimated that 12,830,000 persons were out of work in 1933, about one-fourth of a civilian labor force of more than 51 million.

Roosevelt signed the Federal Emergency Relief Act on May 12, 1933. The president selected Harry L. Hopkins, who headed the New York relief program, to run FERA. A gifted administrator, Hopkins quickly put the program into high gear. He gathered a small staff in Washington and brought the state relief organizations into the FERA system. While the agency tried to provide all the necessities, food came first. City dwellers usually got an allowance for fuel, and rent for one month was provided in case of eviction.

This passage is primarily about

- A. unemployment in the 1930s.
  - B. the effect of unemployment on United States families.
  - C. President Franklin D. Roosevelt’s presidency.
  - D. President Roosevelt’s FERA program.
3. It is said that a smile is universally understood. And nothing triggers a smile more universally than a taste of sugar. Nearly everyone loves sugar. Infant studies indicate that humans are born with an innate love of sweets. Based on statistics, a lot of people in Great Britain must be smiling because on average, every man, woman, and child in that country consumes 95 pounds of sugar each year.

From this passage it seems safe to conclude that the English

- A. do not know that too much sugar is unhealthy.
  - B. eat desserts at every meal.
  - C. are fonder of sweets than most people.
  - D. have more cavities than any other people.
4. With varying success, many women around the world today struggle for equal rights. Historically, women have achieved greater equality with men during periods of social adversity. The following factors initiated the greatest number of improvements for women: violent revolution, world war, and the rigors of pioneering in an undeveloped land. In all three cases, the essential element that improved the status of women was a shortage of men, which required women to perform many of society’s vital tasks.

We can conclude from the information in this passage that

- A. women today are highly successful in winning equal rights.
- B. only pioneer women have been considered equal to men.
- C. historically, women have only achieved equality through force.
- D. historically, the principle of equality alone has not been enough to secure women equal rights.

5. In 1848, Charles Burton of New York City made the first baby carriage, but people strongly objected to the vehicles because they said the carriage operators hit too many pedestrians. Still convinced that he had a good idea, Burton opened a factory in England. He obtained orders for the baby carriages from Queen Isabella II of Spain, Queen Victoria of England, and the Pasha of Egypt. The United States had to wait another 10 years before it got a carriage factory, and only 75 carriages were sold in the first year.

Even after the success of baby carriages in England,

- A. Charles Burton was a poor man.
  - B. Americans were still reluctant to buy baby carriages.
  - C. Americans purchased thousands of baby carriages.
  - D. the United States bought more carriages than any other country.
6. All water molecules form six-sided structures as they freeze and become snow crystals. The shape of the crystal is determined by temperature, vapor, and wind conditions in the upper atmosphere. Snow crystals are always symmetrical because these conditions affect all six sides simultaneously.

The purpose of the passage is to present

- A. a personal observation.
  - B. a solution to a problem.
  - C. actual information.
  - D. opposing scientific theories.
7. In the words of Thomas DeQuincey, “It is notorious that the memory strengthens as you lay burdens upon it.” If, like most people, you have trouble recalling the names of those you have just met, try this: The next time you are introduced, plan to remember the names. Say to yourself, “I’ll listen carefully; I’ll repeat each person’s name to be sure I have it, and I will remember.” You’ll discover how effective this technique is and probably recall those names for the rest of your life.

The writer believes people remember names best when they

- a. meet new people
  - b. are intelligent
  - c. decide to do so
  - d. are interested in people
8. Many people have owned, or have heard of, traditional “piggy banks,” coin banks shaped like pigs. A logical theory about how this tradition started might be that because pigs often symbolize greed, the object is to “fatten” one’s piggy bank with as much money as possible.

However, while this idea makes sense, it is not the correct origin of the term. The genesis of the piggy bank is the old English word “pygg,” which was a common kind of clay hundreds of years ago in England. People used pots and jars made out of this red “pygg” clay for many different purposes in their homes. Sometimes they kept their money in one of the pots, and this was known as a pygg bank. Over the years, because “pygg” and “pig” sounded the same, glaziers began making novelty banks out of pottery in the shape of a pig as a kind of joke. These banks were given as gifts and exported

to countries where people spoke other languages and where no one had ever heard of pygg clay. The tradition caught on all over the world, and today piggy banks come in all colors and are made of all kinds of materials, including plastic.

This passage is mainly about

- A. how people in different countries save their money
  - B. how people in England made pottery centuries ago
  - C. how a common expression began in a surprising way
  - D. how an unusual custom got started
9. It is said that a smile is universally understood. And nothing triggers a smile more universally than the taste of sugar. Nearly everyone loves sugar. Infant studies indicate that humans are born with an innate love of sweets. Based on statistics, a lot of people in Great Britain must be smiling because on average, every man, woman and child in that country consumes 95 pounds of sugar each year.

This passage implies that the writer thinks that 95 pounds of sugar per person per year is

- A. a surprisingly large amount
  - B. a surprisingly small amount
  - C. about what one would expect
  - D. an unhealthy amount
10. The wheel has been used by humans since nearly the beginning of civilization and is considered one of the most important mechanical inventions of all time. Most primitive technologies since the invention of the wheel have been based on its principles, and since the industrial revolution, the wheel has been a basic element of nearly every machine constructed by humankind. No one knows the exact time and place of the invention of the wheel, but its beginnings can be seen across many ancient civilizations.

According to this passage, the wheel is an important invention because

- a. it is one of the world’s oldest inventions
  - b. it forms the basis of so many later inventions
  - c. it is an invention that can be traced to many cultures
  - d. it is one the world’s most famous inventions
11. Samuel Morse, best known today as the inventor of Morse Code and one of the inventors of the telegraph, was originally a prominent painter. While he was always interested in technology and studied electrical engineering in college, Morse went to Paris to learn from famous artists of his day and later painted many pictures that now hang in museums, including a portrait of former President John Adams. In 1825, Morse was in Washington, D.C., painting a portrait of the Marquis de Lafayette when a messenger arrived on horseback to tell him that his wife was gravely ill back at his home in Connecticut. The message had taken several days to reach him because of the distance. Morse rushed to his home as fast as he could, but his wife had already passed away by the time he arrived. Grief-stricken, he gave up painting and devoted the rest of his life to finding ways to transmit messages over long distances faster.

Morse left the art world and helped to invent the telegraph

- A. because he was tired of painting

- B. because he wanted to communicate with people far away
- C. because of a personal tragedy in his life
- D. because he was fascinated by science

12. Leonardo DaVinci is not only one of the most famous artists in history, he was also a botanist, a writer and an inventor. Even though most of his inventions were not actually built in his lifetime, many of today's modern machines can be traced back to some of his original designs. The parachute, the military tank, the bicycle and even the airplane were foretold in the imaginative drawings that can still be seen in the fragments of Leonardo's notebooks. Over 500 years ago, this man conceived ideas that were far ahead of his time.

The author of this passage is praising Leonardo DaVinci for his:

- A. artistic talent
- B. intelligence
- C. vision
- D. fame

### Directions for questions 13–22

*For the questions that follow, two underlined sentences are followed by a question or statement. Read the sentences, then choose the best answer to the question or the best completion of the statement.*

13. The Midwest is experiencing its worst drought in 15 years.

Corn and soybean prices are expected to be very high this year.

What does the second sentence do?

- A. It restates the idea found in the first.
- B. It states an effect.
- C. It gives an example.
- D. It analyzes the statement made in the first.

14. Social studies classes focus on the complexity of our social environment.

The subject combines the study of history and the social sciences and promotes skills in citizenship.

What does the second sentence do?

- A. It expands on the first sentence.
- B. It makes a contrast.
- C. It proposes a solution.
- D. It states an effect.

15. Knowledge of another language fosters greater awareness of cultural diversity among the peoples of the world.

Individuals who have foreign language skills can appreciate more readily other peoples' values and ways of life.

How are the two sentences related?

- A. They contradict each other.
- B. They present problems and solutions.
- C. They establish a contrast.
- D. They repeat the same idea.

16. Serving on a jury is an important obligation of citizenship.

Many companies allow their employees paid leaves of absence to serve on juries.

What does the second sentence do?

- A. It reinforces what is stated in the first.
- B. It explains what is stated in the first.
- C. It expands on the first.
- D. It draws a conclusion about what is stated in the first.

17. While most people think of dogs as pets, some dogs are bred and trained specifically for certain types of work.

The bloodhound's acute sense of smell and willing personality make it ideal for tracking people missing in the woods.

What does the second sentence do?

- A. It makes a contrast.
- B. It restates an idea found in the first.
- C. It states an effect.
- D. It gives an example.

18. Paris, France, is a city that has always been known as a center of artistic and cultural expression.

In the 1920s, Paris was home to many artists and writers from around the world who became famous, such as Picasso and Hemingway.

What does the second sentence do?

- A. It reinforces the first.
- B. It states an effect.
- C. It draws a conclusion.
- D. It provides a contrast.

19. Studies show that the prevalence of fast-food restaurants corresponds with the rates of obesity in both children and adults.

Obesity is now on the rise in countries outside the U.S., where fast food restaurants are becoming more common.

How do the two sentences relate?

- A. They express roughly the same idea.
- B. They contradict each other.
- C. They present problems and solutions.
- D. They establish a contrast.

20. Compared with the rest of the country, North Dakota has a thriving economy, making it a place where more people want to live.

Winters in North Dakota are inhospitable, with average temperatures in January ranging from 2 degrees Fahrenheit to 17 degrees.

What does the second sentence do?

- A. It reinforces the first.
  - B. It explains what is stated in the first.
  - C. It contradicts the first.
  - D. It analyzes a statement made in the first.
21. Some stores are testing a new checkout system that allows shoppers to use their mobile phones to scan items as they walk through stores and pay at self-service kiosks, skipping the cashiers' lines.

The new mobile checkout system is intended to reduce long lines and customer wait times in stores.

What does the second sentence do?

- A. It expands on the first.
  - B. It states an effect.
  - C. It contrasts with the first.
  - D. It gives an example.
22. According to the American Sleep Disorders Association, the average teenager needs around 9.5 hours of sleep per night, possibly because critical growth hormones are released during sleep.

The average adult requires between six and eight hours of sleep per night for optimal health and productivity.

How do the two sentences relate?

- A. They establish a contrast.
- B. They contradict each other.
- C. They reinforce each other.
- D. They provide a problem and solution.

## Arithmetic

This test measures your ability to perform basic arithmetic operations and to solve problems that involve fundamental arithmetic concepts. There are 17 questions on the Arithmetic tests, divided into three types.

- Operations with whole numbers and fractions: Topics included in this category are addition, subtraction, multiplication, division, recognizing equivalent fractions and mixed numbers, and estimating.
- Operations with decimals and percents: Topics include addition, subtraction, multiplication, and division with decimals. Percent problems, recognition of decimals, fraction and percent equivalencies, and problems involving estimation are also given.
- Applications and problem solving: Topics include rate, percent and measurement problems; simple geometry problems; and distribution of a quantity into its fractional parts.

## Arithmetic Sample Questions

For each of the questions below, choose the best answer from the four choices given. You may use the paper you received as scratch paper.

1.  $2.75 + .003 + .158 =$ 
  - A. 4.36
  - B. 2.911
  - C. 0.436
  - D. 2.938
2.  $7.86 \times 4.6 =$ 
  - A. 36.156
  - B. 36.216
  - C. 351.56
  - D. 361.56
3.  $\frac{7}{20} =$ 
  - A. 0.035
  - B. 0.858
  - C. 0.35
  - D. 3.5
4. Which of the following is the least?
  - A. 0.105
  - B. 0.501
  - C. 0.015
  - D. 0.15
5. All of the following are ways to write 25 percent of N EXCEPT
  - A. 0.25 N
  - B.  $\frac{25N}{100}$
  - C.  $\frac{1}{4} N$
  - D. 25 N
6. Which of the following is closest to  $27.8 \times 9.6$ ?
  - A. 280
  - B. 300
  - C. 2,800
  - D. 3,000
7. A soccer team played 160 games and won 65 percent of them. How many games did it win?
  - A. 94
  - B. 104
  - C. 114
  - D. 124

8. Three people who work full-time are to work together on a project, but their total time on the project is to be equivalent to that of only one person working full-time. If one of the people is budgeted for one-half of his time to the project and a second person for one-third of her time, what part of the third worker's time should be budgeted to this project?
- $\frac{1}{3}$
  - $\frac{3}{5}$
  - $\frac{1}{6}$
  - $\frac{1}{8}$
9. 32 is 40 percent of what number?
- 12.8
  - 128
  - 80
  - 800
10.  $3\frac{1}{3} - 2\frac{2}{5} =$
- $1\frac{1}{2}$
  - $\frac{1}{15}$
  - $\frac{14}{15}$
  - $1\frac{1}{15}$
11.  $2\frac{1}{2} + 4\frac{2}{3} =$
- $6\frac{1}{6}$
  - $6\frac{5}{6}$
  - $7\frac{1}{6}$
  - $7\frac{5}{6}$
12. What is  $\frac{1,345}{99}$  rounded to the nearest integer?
- 12
  - 13
  - 14
  - 15
13. Three of four numbers have a sum of 22. If the average of the four numbers is 8, what is the fourth number?
- 4
  - 6
  - 8
  - 10
14.  $46.2 \times 10^{-2} =$
- 0.0462
  - 0.462
  - 4.62
  - 462
15. If  $\frac{3}{2} \div \frac{1}{4} = n$ , then  $n$  is between
- 1 and 3
  - 3 and 5
  - 5 and 7
  - 7 and 9
16. What is 12% of 120?
- 10
  - 14.4
  - 18.4
  - 28.8
17. A box in a college bookstore contains books, and each book in the box is a history book, an English book or a science book. If one-third of these books are history books and one-sixth are English books, what fraction of the books are science books?
- $\frac{1}{3}$
  - $\frac{1}{2}$
  - $\frac{2}{3}$
  - $\frac{3}{4}$
18. The measures of two angles of a triangle are  $35^\circ$  and  $45^\circ$ . What is the measure of the third angle of the triangle?
- $95^\circ$
  - $100^\circ$
  - $105^\circ$
  - $110^\circ$

## Elementary Algebra Sample Questions

For each of the questions below, choose the best answer from the four choices given. You may use the paper you received as scratch paper.

19. Erica bought  $3\frac{1}{2}$  yards of fabric. If she uses  $\frac{2}{3}$  of the fabric to make a curtain, how much will she have left?

- A.  $\frac{1}{6}$  yd.
- B.  $\frac{1}{3}$  yd.
- C.  $1\frac{1}{6}$  yd.
- D.  $2\frac{1}{3}$  yd.

20. Jen wants to tile the floor of her kitchen. The floor is rectangular and measures 12 feet by 8 feet. If it costs \$2.50 per square foot for the materials, what is the total cost of the materials for tiling the kitchen floor?

- A. \$160
- B. \$200
- C. \$220
- D. \$240

## Elementary Algebra

A total of 12 questions of three types are administered in this test.

- The first type involves operations with integers and rational numbers, and includes computation with integers and negative rationals, the use of absolute values, and ordering.
- The second type involves operations with algebraic expressions using evaluation of simple formulas and expressions, and adding and subtracting monomials and polynomials. Questions involve multiplying and dividing monomials and polynomials, the evaluation of positive rational roots and exponents, simplifying algebraic fractions, and factoring.
- The third type of question involves translating written phrases into algebraic expressions and solving equations, inequalities, word problems, linear equations and inequalities, quadratic equations (by factoring), and verbal problems presented in an algebraic context.

1. If A represents the number of apples purchased at 15 cents each, and B represents the number of bananas purchased at 10 cents each, which of the following represents the total value of the purchases in cents?

- A.  $A + B$
- B.  $25(A + B)$
- C.  $10A + 15B$
- D.  $15A + 10B$

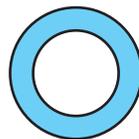
2.  $\sqrt{2} \times \sqrt{15} = ?$

- A. 17
- B. 30
- C.  $\sqrt{30}$
- D.  $\sqrt{17}$

3. What is the value of the expression  $2x^2 + 3xy - 4y^2$  when  $x = 2$  and  $y = -4$ ?

- A. -80
- B. 80
- C. -32
- D. 32

4. In the figure below, both circles have the same center, and the radius of the larger circle is  $R$ . If the radius of the smaller circle is 3 units less than  $R$ , which of the following represents the area of the shaded region?



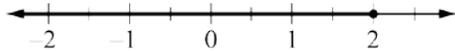
- A.  $\pi R^2$
- B.  $\pi(R - 3)^2$
- C.  $\pi R^2 - \pi \times 3^2$
- D.  $\pi R^2 - \pi(R - 3)^2$

5.  $(3x - 2y)^2 =$

- A.  $9x^2 - 4y^2$
- B.  $9x^2 + 4y^2$
- C.  $9x^2 + 4y^2 - 6xy$
- D.  $9x^2 + 4y^2 - 12xy$

6. If  $x > 2$ , then  $\frac{x^2 - x - 6}{x^2 - 4} =$

- A.  $\frac{x-3}{2}$
- B.  $\frac{x-3}{x-2}$
- C.  $\frac{x-3}{x+2}$
- D.  $\frac{3}{2}$

7.  $\frac{4 - (-6)}{-5} =$
- $\frac{2}{5}$
  - $-\frac{2}{5}$
  - 2
  - 2
8. If  $2x - 3(x + 4) = -5$ , then  $x =$
- 7
  - 7
  - 17
  - 17
9.  $-3(5 - 6) - 4(2 - 3) =$
- 7
  - 7
  - 1
  - 1
10. Which of the following expressions is equivalent to  $20 - \frac{4}{5}x \geq 16$ ?
- $x \leq 5$
  - $x \geq 5$
  - $x \geq 32\frac{1}{2}$
  - $x \leq 32\frac{1}{2}$
11. Which of the following lists of numbers is ordered from least to greatest?
- $-\frac{1}{3}, -\frac{3}{5}, \frac{2}{3}, \frac{3}{5}$
  - $-\frac{3}{5}, -\frac{1}{3}, \frac{3}{5}, \frac{2}{3}$
  - $-\frac{1}{3}, -\frac{3}{5}, \frac{3}{5}, \frac{2}{3}$
  - $-\frac{3}{5}, -\frac{1}{3}, \frac{2}{3}, \frac{3}{5}$
12. If  $5t + 2 = 6$ , then  $t =$
- 8
  - $\frac{5}{4}$
  - $\frac{4}{5}$
  - 8
13. For which of the following equations are  $x = 5$  and  $x = -5$  both solutions?
- $x^2 - x^2 - 5x - 25 = 0$
  - $x^2 + 25 = 0$
  - $x^2 + 10x - 25 = 0$
  - $x^2 - 25 = 0$
14. If  $x \neq 0$ , then  $\frac{u}{x} + \frac{5u}{x} - \frac{u}{5x} =$
- $\frac{7x}{5u}$
  - $\frac{5u}{7x}$
  - $\frac{29u}{5x}$
  - $\frac{31u}{5x}$
15. 
- The solution set of which of the following inequalities is graphed on the number line above?
- $2x - 4 \geq -3$
  - $2x + 5 \leq 6$
  - $3x - 1 \leq 5$
  - $4x - 1 \geq 7$
16.  $2x + 6y = 5$   
 $x + 3y = 2$
- How many solutions  $(x, y)$  are there to the system of equations above?
- None
  - One
  - Two
  - More than two
17. Which of the following is a factor of both  $x^2 - x - 6$  and  $x^2 - 5x + 6$ ?
- $x - 3$
  - $x + 3$
  - $x - 2$
  - $x + 2$

## College-Level Mathematics Test

The College-Level Mathematics test measures your ability to solve problems that involve college-level mathematics concepts. There are six content areas measured on this test: (a) Algebraic Operations, (b) Solutions of Equations and Inequalities, (c) Coordinate Geometry, (d) Applications and other Algebra Topics, (e) Functions and (f) Trigonometry. The Algebraic Operations content area includes the simplification of rational algebraic expressions, factoring and expanding polynomials, and manipulating roots and exponents. The Solutions of Equations and Inequalities content area includes the solution of linear and quadratic equations and inequalities, systems of equations, and other algebraic equations. The Coordinate Geometry content area presents questions involving plane geometry, the coordinate plane, straight lines, conics, sets of points in the plane, and graphs of algebraic functions. The Functions content area includes questions involving polynomial, algebraic, exponential and logarithmic functions. The Trigonometry content area includes trigonometric functions. The Applications and other Algebra Topics content area contains complex numbers, series and sequences, determinants, permutations and combinations, factorials, and word problems. A total of 20 questions are administered on this test.

### Sample Questions

*For each of the questions below, choose the best answer from the four choices given. You may use the paper you received as scratch paper.*

1.  $2^{\frac{5}{2}} - 2^{\frac{3}{2}}$

A.  $2^{\frac{1}{2}}$

B. 2

C.  $2^{\frac{3}{2}}$

D.  $2^{\frac{5}{3}}$

E.  $2^2$

18.  $\frac{10x^6 + 8x^4}{2x^2} =$

A.  $9x^{12}$

B.  $14x^4$

C.  $5x^4 + 4x^2$

D.  $5x^3 + 2x^2$

19. A rectangular yard has area 96 square feet. If the width of the yard is 4 feet less than the length, what is the perimeter, in feet, of the yard?

A. 40

B. 44

C. 48

D. 52

20. On Monday, it took Helen 3 hours to do a page of science homework exercises. The next day she did the same number of exercises in 2 hours. If her average rate on Monday was  $p$  exercises per hour, what was her average rate the next day, in terms of  $p$ ?

A.  $2(p + 1)$  exercises per hour

B.  $3(p - 1)$  exercises per hour

C.  $\frac{2}{3}p$  exercises per hour

D.  $\frac{3}{2}p$  exercises per hour

2. If  $a \neq b$  and  $\frac{1}{x} + \frac{1}{a} = \frac{1}{b}$ , then  $x =$

- A.  $\frac{1}{b} - \frac{1}{a}$
- B.  $b - a$
- C.  $\frac{1}{ab}$
- D.  $\frac{a-b}{ab}$
- E.  $\frac{ab}{a-b}$

3. If  $3x^2 - 2x + 7 = 0$ , then  $(x - \frac{1}{3})^2 =$

- A.  $\frac{20}{9}$
- B.  $\frac{7}{9}$
- C.  $-\frac{7}{9}$
- D.  $-\frac{8}{9}$
- E.  $-\frac{20}{9}$

4. The graph of which of the following equations is a straight line parallel to the graph of  $y = 2x$ ?

- A.  $4x - y = 4$
- B.  $2x - 2y = 2$
- C.  $2x - y = 4$
- D.  $2x + y = 2$
- E.  $x - 2y = 4$

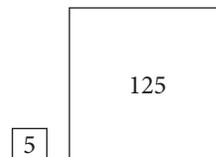
5. An equation of the line that contains the origin and the point (1, 2) is

- A.  $y = 2x$
- B.  $2y = x$
- C.  $y = x - 1$
- D.  $y = 2x + 1$
- E.  $\frac{y}{2} = x - 1$

6. An apartment building contains 12 units consisting of one- and two-bedroom apartments that rent for \$360 and \$450 per month, respectively. When all units are rented, the total monthly rental is \$4,950. What is the number of two-bedroom apartments?

- A. 3
- B. 4
- C. 5
- D. 6
- E. 7

7. If the two square regions in the figures below have the respective areas indicated in square yards, how many yards of fencing are needed to enclose the two regions?



- A.  $4\sqrt{130}$
- B.  $20\sqrt{10}$
- C.  $24\sqrt{5}$
- D. 100
- E.  $104\sqrt{5}$

8. If  $\log_{10} x = 3$ , then  $x =$

- A.  $3^{10}$
- B. 1,000
- C. 30
- D.  $\frac{10}{3}$
- E.  $\frac{3}{10}$

9. If  $f(x) = 2x + 1$  and  $g(x) = \frac{x-1}{2}$ , then  $f(g(x)) =$

- A.  $x$
- B.  $\frac{x-1}{4x+2}$
- C.  $\frac{4x+2}{x-1}$
- D.  $\frac{5x+1}{2}$
- E.  $\frac{(2x+1)(x-1)}{2}$

10. If  $\theta$  is an acute angle and  $\sin \theta = \frac{1}{2}$ , then  $\cos \theta =$

- A. -1
- B. 0
- C.  $\frac{1}{2}$
- D.  $\frac{\sqrt{3}}{2}$
- E. 2

11.  $5y(2y - 3) + (2y - 3) =$

- A.  $(5y + 1)(2y + 3)$
- B.  $(5y + 1)(2y - 3)$
- C.  $(5y - 1)(2y + 3)$
- D.  $(5y - 1)(2y - 3)$
- E.  $10y(2y - 3)$

12. For what real numbers  $x$  is  $x^2 - 6x + 9$  negative?

- A.  $-3 < x < 3$
- B.  $x < -3$  or  $x > 3$
- C.  $x = -3$  or  $x = 3$
- D.  $0 < x < 6$
- E. For no real numbers  $x$

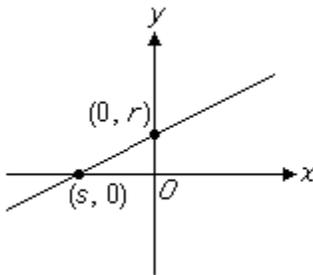
13. A root of  $x^2 - 5x - 1 = 0$  is

- A.  $\frac{1 - \sqrt{29}}{2}$
- B.  $\frac{5 - \sqrt{17}}{2}$
- C.  $\frac{1 + \sqrt{29}}{2}$
- D.  $\frac{5 + \sqrt{17}}{2}$
- E.  $\frac{5 + \sqrt{29}}{2}$

14. In the  $xy$ -plane, the graph of  $y = x^2$  and the circle with center  $(0,1)$  and radius 3 have how many points of intersection?

- A. None
- B. One
- C. Two
- D. Three
- E. More than three

15.



If an equation of the linear function in the figure above is  $y = mx + b$ , then  $m =$

- A.  $-\frac{r}{s}$
- B.  $\frac{r}{s}$
- C.  $rs$
- D.  $r$
- E.  $-s$

16. One ordering of the letters  $T, U, V$  and  $W$  from left to right is  $UTVW$ . What is the total number of orderings of these letters from left to right, including  $UTVW$ ?

- A. 8
- B. 12
- C. 16
- D. 20
- E. 24

17. If  $f(x) = \frac{3x-1}{2}$  and  $f^{-1}$  is the inverse of  $f$ , what is the value of  $f^{-1}(3)$ ?

- A.  $\frac{1}{3}$
- B.  $\frac{2}{3}$
- C. 1
- D. 2
- E.  $\frac{7}{3}$

18. The sequence  $\{a_n\}$  is defined by  $a_0 = 1$  and

$a_{n+1} = 2a_n + 2$  for  $n = 0, 1, 2, \dots$ . What is the value of  $a_3$ ?

- A. 8
- B. 10
- C. 16
- D. 20
- E. 22

19. From 5 employees at a company, a group of 3 employees will be chosen to work on a project. How many different groups of 3 employees can be chosen?

- A. 3
- B. 5
- C. 6
- D. 10
- E. 15

20. If  $f(x) = \left(\frac{1}{3}\right)^x$  and  $a < b$ , which of the following must be true?

- A.  $f(a) + f(b) = 3$
- B.  $f(a) + \frac{1}{3} = f(b)$
- C.  $f(a) = f(b)$
- D.  $f(a) < f(b)$
- E.  $f(a) > f(b)$

# Answer Key

SENTENCE SKILLS	
QUESTION NUMBER	CORRECT ANSWER
1	D
2	A
3	B
4	C
5	B
6	B
7	C
8	D
9	A
10	B
11	D
12	D
13	C
14	A
15	B
16	A
17	D
18	B
19	A
20	D
21	B
22	C
23	B
24	B
25	C

READING COMPREHENSION	
QUESTION NUMBER	CORRECT ANSWER
1	C
2	D
3	C
4	D
5	B
6	C
7	C
8	C
9	A
10	B
11	C
12	C
13	B
14	A
15	D
16	A
17	D
18	A
19	A
20	C
21	B
22	A

# Answer Key

ARITHMETIC	
QUESTION NUMBER	CORRECT ANSWER
1	B
2	A
3	C
4	C
5	D
6	A
7	B
8	C
9	C
10	C
11	C
12	C
13	D
14	B
15	C
16	B
17	B
18	B
19	C
20	D

ELEMENTARY ALGEBRA	
QUESTION NUMBER	CORRECT ANSWER
1	D
2	C
3	A
4	D
5	D
6	B
7	D
8	B
9	B
10	A
11	B
12	C
13	D
14	C
15	C
16	A
17	A
18	C
19	A
20	D

## Answer Key

COLLEGE-LEVEL MATHEMATICS	
QUESTION NUMBER	CORRECT ANSWER
1	C
2	E
3	E
4	C
5	A
6	E
7	C
8	B
9	A
10	D
11	B
12	E
13	E
14	C
15	A
16	E
17	E
18	E
19	D
20	E