

# College of Admission Tests

Test Taker's Help Series



CAT

## Sample Questions

The Sample Questions are provided to familiarize you with the contents of the section.

## Problem Solving



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Sample Questions for:  
Problem Solving  
Difficulty Level: 1-5 of 10

Purpose of this set of sample questions is to familiarize the test taker with the question types that appear on the actual test.

## Problem Solving

### Directions:

Solve each problem and indicate the best of the answer choices given.

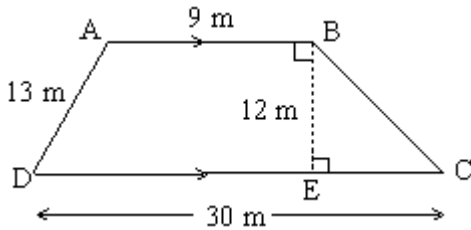
**Numbers:** All numbers used are real numbers.

**Figures:** A figure accompanying a problem solving question is intended to provide information useful in solving the problem. Figures are drawn as accurately as possible EXCEPT when it is stated in a specific problem that its figure is not drawn to scale. Straight lines may sometimes appear jagged. All figures lie on a plane unless otherwise indicated.

- A rectangle is 14 cm long and 10 cm wide. If the length is reduced by  $x$  cm and its width is increased also by  $x$  cm so as to make it a square then its area changes by :
  - 4
  - 144
  - 12
  - 2
  - None of the above.
- A motorcycle stunt man rides over the vertical walls of a circular well at an average speed of 54 km/h for 5 minutes. If the radius of the well is 5 meters then the distance traveled is:
  - 2.5 km
  - 3.5 km
  - 4.5 km
  - 5.5 km
  - None of the above
- If 1 cm on a map corresponds to an actual distance of 40 km. And the distance on the map between Multan and Karachi is 37.5 cm, the actual distance between them is :
  - 375 km
  - 3750 km
  - 1500 km
  - 1375 km
  - None of the above
- A box contains 90 nuts each of 100 gm and 100 bolts each of 150 gm. If the entire box weighs 35.5 kg, then the weight of the empty box is :
  - 10 kg
  - 10.5 kg
  - 11 kg
  - 11.5 kg
  - None of the above
- In Country X a returning tourist may import goods with a total value of \$500 or less tax free, but must pay an 8 percent tax on the portion of the total value in excess of \$500. What tax must be paid by a returning tourist who imports goods with a total value of \$730?
  - \$12.80
  - \$24.60
  - \$18.40
  - \$58.40
  - None of the above
- If the radius of a circle is increased by 20% then the area is increased by :
  - 44%
  - 120%
  - 144%
  - 40%
  - None of the above
- Tom, Dick and Harry went for lunch to a restaurant. Tom had \$100 with him, Dick had \$60 and Harry had \$409. They got a bill for \$104 and decided to give a tip of \$16. They further decided to share the total expenses in the ratio of the amounts of money each carried. The amount of

money which Tom paid more than what Harry paid is

- A. 120
  - B. 200
  - C. 60
  - D. 24
  - E. 36
8. A plot of land is in the shape of a trapezium whose dimensions are given in the figure below :



Hence the perimeter of the field is

- A. 50 m
  - B. 64 m
  - C. 72 m
  - D. 84 m
  - E. None of the above
9. The amounts of time that three secretaries worked on a special project are in the ratio of 1 to 2 to 5. If they worked a combined total of 112 hours, how many hours did the secretary who worked the longest spend on the project?
- A. 80
  - B. 70
  - C. 56
  - D. 16
  - E. 24
10. Four concentric (having the same center) circles with radii,  $x$ ,  $2x$ ,  $3x$  and  $4x$  are drawn to form two rings A and B as shown in the figure.

Ratio of the area of inner ring A to the area of outer ring B is

- A. 1 : 2
  - B. 1 : 4
  - C. 2 : 3
  - D. 3 : 7
  - E. 7 : 3
11. If  $3/p = 6$  and  $3/q = 15$  then  $p - q = ?$
- A.  $1/3$
  - B.  $2/5$
  - C.  $3/10$
  - D.  $5/6$
  - E.  $10/3$

12. Kati is three times as old as her son. After fifteen years she will be twice as old as her son. Hence Kati's age now is

- A. 36
  - B. 42
  - C. 45
  - D. 48
  - E. 56
13.  $(1/4)^3 + (3/4)^3 + 3(1/4)(3/4)(1/4 + 3/4) = ?$

- A.  $1/64$
- B.  $27/64$
- C.  $49/64$
- D. 0
- E. 1

14. If the area of two circles are in the ratio 169 : 196 then the ratio of their radii is

- A. 10 : 11
- B. 11 : 12
- C. 12 : 13
- D. 13 : 14
- E. 16 : 19

15. A semi-circle is surmounted on the side of a square. The ratio of the area of the semi-circle to the area of the square is

- A. 1 : 2
- B.  $2 : \pi$
- C.  $\pi : 8$
- D.  $8 : \pi$
- E. None of the above

16. Which of the following is the greatest?

- A. 40% of 30
- B.  $3/5$  of 25
- C. 6.5% of 200
- D. Five more than the square of 3
- E.  $1/2^{-4}$

17. Two identical taps fill  $2/5$  of a tank in 20 minutes. When one of the taps goes dry in how many minutes will the remaining one tap fill the rest of the tank?

- A. 5 minutes
- B. 10 minutes
- C. 15 minutes
- D. 20 minutes

- E. None of the above
18. If the value of XYZ Company stock drops from \$25 per share to \$21 per share, what is the percent of the decrease?
- A. 4  
B. 8  
C. 12  
D. 16  
E. 20
19. If a building  $b$  feet high casts a shadow  $f$  feet long, then, at the same time of day, a tree  $t$  feet high will cast a shadow how many feet long?
- A.  $ft/b$   
B.  $fb/t$   
C.  $b/ft$   
D.  $tb/f$   
E.  $t/fb$
20. If  $x$ ,  $y$ , and  $z$  are consecutive negative integers, and if  $x > y > z$ , which of the following must be a positive odd integer?
- A.  $xyz$   
B.  $(x - y)(y - z)$   
C.  $x - yz$   
D.  $x(y + z)$   
E.  $x + y + z$
21. At a certain ice cream parlor, customers can choose among five different ice cream flavors and can choose either a sugar cone or a waffle cone. Considering both ice cream flavor and cone type, how many distinct triple-scoop cones with three different ice cream flavors are available?
- A. 12  
B. 16  
C. 20  
D. 24  
E. 30
22. What is the greatest value of a positive integer  $n$  such that  $3n$  is a factor of 1815?
- A. 15  
B. 18  
C. 30  
D. 33
- E. 45
21. If  $0.2t = 2.2 - 0.6s$  and  $0.5s = 0.2t + 1.1$ , then  $s =$
- A. 1  
B. 3  
C. 10  
D. 11  
E. 30
22. Five years ago, Beth's age was three times that of Amy. Ten years ago, Beth's age was one half that of Chelsea. If  $C$  represents Chelsea's current age, which of the following represents Amy's current age?
- A.  $c/6 + 5$   
B.  $2c$   
C.  $(c-10)/3$   
D.  $3c-5$   
E.  $5c/3 - 10$
23. A portion of \$7200 is invested at a 4% annual return, while the remainder is invested at a 5% annual return. If the annual income from both portions is the same, what is the total income from the two investments?
- A. \$160  
B. \$320  
C. \$400  
D. \$720  
E. \$1,600
24. An empty swimming pool can be filled to capacity through an inlet pipe in 3 hours, and it can be completely drained by a drainpipe in 6 hours. If both pipes are fully open at the same time, in how many hours will the empty pool be filled to capacity?
- A. 4  
B. 4.5  
C. 5  
D. 5.5  
E. 6
25. If  $r = (3p + q)/2$  and  $s = p - q$ , for which of the following values of  $p$  would  $r^2 = s^2$ ?
- A.  $1q/5$   
B.  $10 - 3q/2$   
C.  $q - 1$   
D.  $3q$   
E.  $9q/2 - 9$
26. At 10 a.m. two trains started traveling toward each other from stations 287 miles apart. They passed each other at 1:30 p.m. the same day. If the average speed of the faster train exceeded the average speed of the slower train by 6 miles

per hour, which of the following represents the speed of the faster train, in miles per hour?

- A. 38  
B. 40  
C. 44  
D. 48  
E. 50
27. On the  $xy$ -coordinate plane, points A and B both lie on the circumference of a circle whose center is O, and the length of AB equals the circle's diameter. If the  $(x,y)$  coordinates of O are  $(2,1)$  and the  $(x,y)$  coordinates of B are  $(4,6)$ , what are the  $(x,y)$  coordinates of A?
- A.  $(3, 3/2)$   
B.  $(1, 2/2)$   
C.  $(0, -4)$   
D.  $(2/2, 1)$   
E.  $(-1, -2/2)$
28. If a rectangle's length and width are both doubled, by what percent is the rectangle's area increased?
- A. 50  
B. 100  
C. 200  
D. 300  
E. 400
29. A rectangular tank 10" by 8" by 4" is filled with water. If all of the water is to be transferred to cube-shaped tanks, each one 3 inches on a side, how many of these smaller tanks are needed?
- A. 9  
B. 12  
C. 16  
D. 21  
E. 39
31. The average wages of a worker during a fortnight comprising 15 consecutive working days was \$ 90 per day. During the first 7 days, his average wages was \$ 87 per day and the average wages during the last 7 days was \$92 per day. What was his wage on the 8th day?
- A. 83  
B. 92  
C. 90  
D. 97
32. If  $a, b$  and  $c$  are nonzero numbers and  $a + b = c$ , which of the following is equal to 1?
- A.  $\frac{a-b}{c}$
- B.  $\frac{a-c}{b}$   
C.  $\frac{b-c}{a}$   
D.  $\frac{b-a}{c}$   
E.  $\frac{c-b}{a}$
33. Last year Carlos saved 10 percent of his annual earnings. This year he earned 5 percent more than last year and he saved 12 percent of his annual earnings. The amount saved this year was what percent of the amount saved last year?
- A. 122%  
B. 124%  
C. 126%  
D. 128%  
E. 130%
34. The average age of a group of 12 students is 20 years. If 4 more students join the group, the average age increases by 1 year. The average age of the new students is
- A. 24  
B. 26  
C. 23  
D. 22
35. Which of the following CANNOT be the greatest common divisor of two positive integers  $x$  and  $y$ ?
- A. 1  
B.  $x$   
C.  $y$   
D.  $x - y$   
E.  $x + y$
36. The average age of a family of 5 members is 20 years. If the age of the youngest member be 10 years then what was the average age of the family at the time of the birth of the youngest member?
- A. 13.5  
B. 14  
C. 15  
D. 12.5
37. How much water must be added to 10 quarts of alcohol that is 95% pure in order to obtain a solution that is 50% pure?
- A. 15  
B. 9

## Problem Solving Sample Questions

38. If  $x$ ,  $y$  and  $z$  are positive integers such that  $x$  is a factor of  $y$ , and  $x$  is a multiple of  $z$ , which of the following is NOT necessarily an integer?

- A.  $\frac{x+z}{z}$   
 B.  $\frac{y+z}{x}$   
 C.  $\frac{x+y}{z}$   
 D.  $\frac{xz}{z}$   
 E.  $\frac{yz}{x}$

39. The table below gives the gasoline costs and consumption rates for a certain car driven at 50 miles per hour, using each of two brands of gasoline. How many miles farther can the car be driven at this speed on \$12 worth of brand X gasoline than on \$12 worth of brand Y gasoline?

	Brand X	Brand Y
Miles per Gallon	40	36
Cost per Gallon	\$0.80	\$0.75

- A. 20  
 B. 24  
 C. 84  
 D. 100  
 E. 104

40. A tank contains 10,000 gallons of a solution that is 5 percent sodium chloride by volume. If 2,500 gallons of water evaporate from the tank, the remaining solution will be approximately what percent sodium chloride?

- A. 1.25%  
 B. 3.75%  
 C. 6.25%  
 D. 6.67%  
 E. 11.7%

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For answers and solution explanation of the questions, visit official website of College of Admission tests.

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