

## PRACTICE TEST A

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60 minutes – 60 questions

**Directions:** Answer each question. Choose the correct answer from the 5 choices given. Do not spend too much time on any one problem. Solve as many as you can; then return to the unanswered questions in the time left. Unless otherwise indicated, all of the following should be assumed:

- All numbers used are real numbers.
  - The word *average* indicates the arithmetic mean.
  - Drawings that accompany problems are intended to provide information useful in solving the problems. Illustrative figures may not be drawn to scale.
  - The word *line* indicates a straight line.
- 

1.  $\frac{1}{3} - \frac{2}{15} + \frac{7}{25} = ?$

**DO YOUR FIGURING HERE.**

A.  $\frac{6}{25}$

B.  $\frac{12}{25}$

C.  $\frac{6}{43}$

D.  $\frac{9}{43}$

E.  $\frac{12}{43}$

- 
2. A car traveled 882 miles on 36 gallons of gasoline. How many miles per gallon did the car get on this trip?

F. 21.5

G. 22.5

H. 23.5

J. 24.5

K. 25.5

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3. A yearly newspaper subscription price is \$95.00. At the newsstand the paper costs \$0.45 for each issue printed five days per week. How much money can be saved by purchasing the yearly subscription?

A. \$ 9.00

B. \$12.00

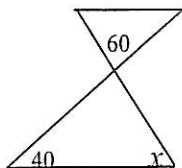
C. \$22.00

D. \$32.00

E. \$43.00

DO YOUR FIGURING HERE.

4. In the figure below, how many degrees is  $\angle x$ ?



- F.  $20^\circ$   
G.  $40^\circ$   
H.  $60^\circ$   
J.  $80^\circ$   
K.  $100^\circ$
- 
5. If  $4x - 3y = 10$ , what is the value of  $12x - 9y$ ?
- A.  $3x$   
B.  $3y$   
C. 10  
D. 20  
E. 30
- 
6. If  $\cos \alpha = \frac{3}{5}$  in the first quadrant, what does  $\cot \alpha$  equal?
- F.  $\frac{3}{4}$   
G.  $\frac{3}{5}$   
H.  $\frac{4}{3}$   
J.  $\frac{4}{5}$   
K.  $\frac{5}{3}$
- 
7. What is the positive value of  $\sqrt{\frac{1}{25}}$  less 0.20?
- A. 5  
B. 0.5  
C. 0.05  
D. 0.005  
E. 0

DO YOUR FIGURING HERE.

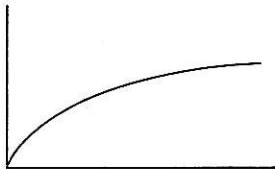
8. If the hypotenuse of isosceles right triangle  $ABC$  is  $8\sqrt{2}$ , what is the area of  $\triangle ABC$ ?

- F. 8
  - G. 16
  - H. 32
  - J. 64
  - K. 128
- 

9. It takes Mr. Smith  $H$  hours to mow his lawn. After three hours it begins to rain. How much of the lawn is not mowed?

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

10. Which of the following best describes the function graphed below?



- F. increasing at an increasing rate
  - G. increasing at a decreasing rate
  - H. decreasing at an increasing rate
  - J. decreasing at a decreasing rate
  - K. A relationship cannot be determined.
- 

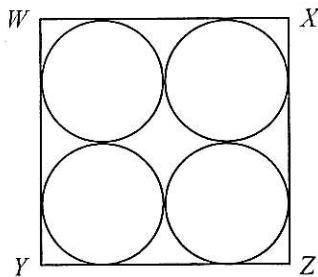
11. What is the quantity  $\frac{7+7+7}{-7-7-7}$  equal to?

- A. +1
- B. -1
- C. +21
- D. -21
- E. -3

DO YOUR FIGURING HERE.

12. What do the graphs of  $y = 6x + 7$  and  $y = -2x + 7$  have in common?
- F. They are parallel to each other.
  - G. They are perpendicular to each other.
  - H. They both pass through the point  $(6, -2)$ .
  - J. They both have the same  $x$ -intercept.
  - K. They both have the same  $y$ -intercept.
- 

13. In the sketch below, the area of each circle is  $4\pi$ . What is the perimeter of  $WXZY$ ?



- A. 8
  - B. 32
  - C.  $16\pi$
  - D. 64
  - E.  $4\pi$
- 
14. The graph of  $y = x^3 + 3x^2 - 2x - 3$  crosses the  $x$ -axis in
- F. exactly two places
  - G. one or two places
  - H. two or three places
  - J. one or three places
  - K. A relationship cannot be determined.
- 

15. In the coordinate plane, a square has vertices  $(4, 3)$ ,  $(-3, 3)$ ,  $(-3, -4)$ , and
- A.  $(4, -4)$
  - B.  $(3, 4)$
  - C.  $(0, 7)$
  - D.  $(4, 0)$
  - E. A relationship cannot be determined.

DO YOUR FIGURING HERE.

16. If  $\csc \theta = \frac{4}{3}$ , what is the value of  $\sin \theta$ ?

- F.  $1\frac{1}{3}$
- G.  $\frac{3}{4}$
- H.  $\frac{4}{3}$
- J.  $\frac{3}{5}$
- K. 1

17. Which symbol below makes this expression true?

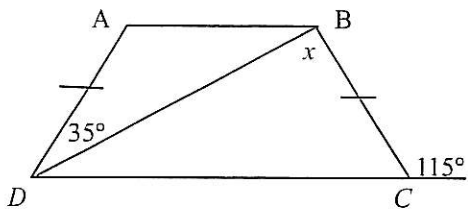
$$2^4 \text{ \_\_\_ } 4^2$$

- A. >
- B. =
- C. <
- D. +/-
- E. A relationship cannot be determined.

18. If  $a^2 - b^2 = 648$ , and  $(a - b) = 24$ , what is the value of  $(a + b)$ ?

- F. 21
- G. 24
- H. 25
- J. 26
- K. 27

19. Given trapezoid  $ABCD$  with  $\overline{AB} \parallel \overline{DC}$  and  $AD = BC$ , what is the measure of  $\angle x$ ?



- A. 5
- B. 65
- C. 75
- D. 85
- E. 95

DO YOUR FIGURING HERE.

20. What is the ratio of the area of a circle with radius  $r$  to the circumference of a circle with radius  $2r$ ?

- F.  $2\pi : r$
  - G.  $r : 2\pi$
  - H.  $r : 4$
  - J.  $1 : 1$
  - K.  $4\pi : 2r$
- 

21. The function  $\begin{array}{|c|c|} \hline M & N \\ \hline O & P \\ \hline \end{array}$  is defined as

$MP - NO$ . What is the value of  $\begin{array}{|c|c|} \hline 2 & 4 \\ \hline 6 & 8 \\ \hline \end{array}$ ?

- A. -8
  - B. -6
  - C. -4
  - D. -2
  - E. 4
- 

22. In a classroom survey of twelve students, it was determined that one-half of the students belong to the Chess Club, one-third belong to the Drama Club, and one-fourth belong to both clubs. How many students are not in either club?

- F. 4
  - G. 5
  - H. 6
  - J. 7
  - K. 13
- 

23. For which value of  $x$  is the inequality  $-2x \geq 6$  true?

- A. -3
- B. -2
- C. -1
- D. 0
- E. 4

DO YOUR FIGURING HERE.

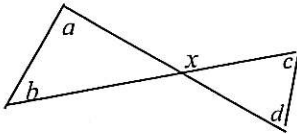
24. One billion minus one million = ?

- F. 10 million
  - G. 99 million
  - H. 100 million
  - J. 101 million
  - K. 999 million
- 

25. The houses on the odd side of Park Avenue are numbered consecutively. How many houses are there with an address less than 1500 and greater than 1465?

- A. 14
  - B. 15
  - C. 16
  - D. 17
  - E. 18
- 

26. Given the sketch below, what is the value of  $a + b + c + d$ ?



- F.  $x$
  - G.  $2x$
  - H.  $180 - x$
  - J.  $180 - 2x$
  - K. 90
- 

27. Assuming  $a \neq 0$ , what is the value of  $a$  in

$$\frac{(15)(16)}{a} = (3)(4)(5)?$$

- A. -4
- B. 0
- C. 4
- D. 31
- E. 60

**DO YOUR FIGURING HERE.**

28. If  $p$  and  $q$  are both positive integers and  $\frac{p-q}{5} = \frac{4}{10}$ , which of the following is true?

- F.  $p > q$
  - G.  $q > p$
  - H.  $p = q$
  - J.  $5p = 4q$
  - K. A relationship between  $p$  and  $q$  cannot be determined.
- 

29. City A is 200 miles east of City C. City B is 150 miles directly north of City C. What is the shortest distance (in miles) between City A and City B?

- A. 200
  - B. 250
  - C. 300
  - D. 350
  - E. 400
- 

30. The relation  $\triangle_R$  is defined as  $\triangle_R = R^2 - 1$ .  $\triangle_8 = ?$

- F. 7
  - G. 21
  - H. 63
  - J. 64
  - K. 512
- 

31. A 24-inch diameter pizza is cut into eight slices. What is the area of one slice?

- A.  $3\pi$
- B.  $6\pi$
- C.  $12\pi$
- D.  $18\pi$
- E.  $\frac{\pi}{8}$



**DO YOUR FIGURING HERE.**

32. The perimeter of a rectangle is 26 units. Which of the following cannot be dimensions of the rectangle?

F. 1 and 12  
G. 4 and 9  
H. 8 and 5  
J. 10 and 6  
K. 11 and 2

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33.  $M$  is the midpoint of line segment  $RS$ . If  $\overline{RM} = 3x + 1$  and  $\overline{RS} = 38$ , what is the value of  $x$ ?

A. 6  
B. 12  
C. 18  
D. 19  
E. 21

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34. Assuming  $x \neq 0$ , how can the expression  $(3x)^2 + 6x^0 + (5x)^0$  be simplified?

F.  $3x^2 + 11$   
G.  $9x^2 + 7$   
H.  $3x^2 + 6$   
J.  $9x^2 + 11$   
K.  $6x^2 + 5$

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35. Which of the following triples cannot be the lengths of the sides of a triangle?

A. 1, 2, 3  
B. 4, 5, 6  
C. 7, 8, 9  
D. 10, 11, 12  
E. 13, 14, 15

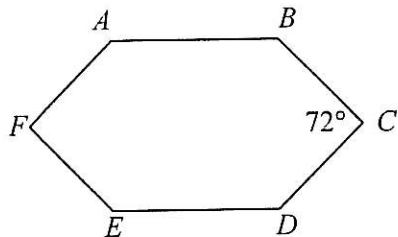
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36. How many two-digit numbers have a remainder of 2 when divided by 10 and also have a remainder of 2 when divided by 4?

F. 2  
G. 4  
H. 6  
J. 8  
K. infinitely many

DO YOUR FIGURING HERE.

37. In the figure below,  $ABCDEF$  is a hexagon and  $m \angle BCD = 72^\circ$ . What is the ratio of  $m \angle BCD$  to the sum of the interior angles of  $ABCDEF$ ?



- A. 1 : 4  
B. 1 : 6  
C. 1 : 8  
D. 1 : 10  
E. 1 : 12
- 
38. Given that  $r$  varies directly as the square of  $d$ , and  $r = 48$  when  $d = 4$ , what is the value of  $r$  when  $d = 20$ ?
- F. 240  
G. 400  
H. 1,200  
J. 1,240  
K. 1,440
- 
39. Roger is a baseball player who gets a hit about  $\frac{1}{3}$  of the times he comes to bat. Last year he batted 636 times. Assuming he had no "walks," how many outs did he make?
- A. 202  
B. 212  
C. 221  
D. 424  
E. 633

DO YOUR FIGURING HERE.

40. What is the slope of the line perpendicular to a line with the equation  $ax + by = c$  ?

- F.  $\frac{b}{a}$
  - G.  $-\frac{b}{a}$
  - H.  $\frac{c}{a}$
  - J.  $-\frac{a}{b}$
  - K.  $b^2 - 4ac$
- 

41. If  $(x - y) = 15$ , what is the value of  $x^2 - 2xy + y^2$ ?

- A. 25
  - B. 30
  - C. 125
  - D. 225
  - E. 625
- 

42. A woman has two rectangular gardens. The larger garden is five times as wide and three times as long as the smaller one. If the area of the smaller one is  $x$ , what is the difference in size of the two gardens?

- F.  $5x$
  - G.  $7x$
  - H.  $14x$
  - J.  $15x$
  - K.  $20x$
- 

43. If  $b^4 - 5 = 226$ , what is the value of  $b^4 + 9$  ?

- A. 240
- B. 235
- C. 231
- D. 221
- E. 212

DO YOUR FIGURING HERE.

44. If the radius of a circle is reduced by 50 percent, by what percent is its area reduced?

F.  $33\frac{1}{3}\%$

G. 50%

H.  $66\frac{2}{3}\%$

J. 75%

K. 80%

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45. If  $12x = 216$ , what is the value of  $\frac{x}{9}$  ?

A. 2

B. 6

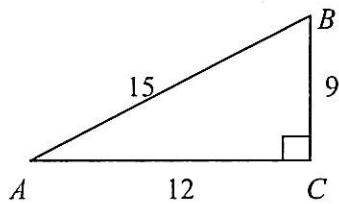
C. 12

D. 18

E. 81

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46. What is the value of  $\cos B$  in the sketch below?



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

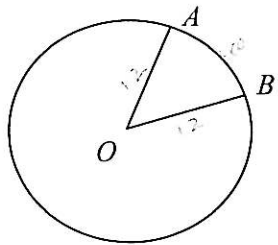
G.  $\frac{3}{5}$

H.  $\frac{4}{5}$

J.  $\frac{5}{3}$

K.  $\frac{5}{4}$

47. Given circle  $O$  with minor arc  $\widehat{AB} = 60^\circ$  and  $OA = 12$ . What is the area of sector  $AOB$ ?



- A.  $12\pi$
- B.  $24\pi$
- C.  $36\pi$
- D.  $72\pi$
- E.  $720\pi$

- 
48. If both  $a$  and  $b$  are negative, what is the value of  $a - b$ ?

- F. positive
- G. negative
- H. zero
- J. one
- K. A relationship cannot be determined.

- 
49. If  $3^{n+1} = 81$ , what is the value of  $n$ ?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

- 
50. A man walks  $d$  miles in  $t$  hours. At that rate, how many hours will it take him to walk  $m$  miles?

- F.  $\frac{mt}{d}$
- G.  $\frac{d}{t}$
- H.  $\frac{md}{t}$
- J.  $\frac{dt}{m}$
- K.  $dtm$

**DO YOUR FIGURING HERE.**

**DO YOUR FIGURING HERE.**

51. Which of the following has the greatest number of integer factors other than itself and one?

A. 12  
B. 16  
C. 24  
D. 27  
E. 29

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52. Paterson Pond was stocked with 2,000 fish, all bass and trout. The ratio of bass to trout was 3 : 2. How many of each type were put in the pond?

F. 800 bass and 1,200 trout  
G. 1,200 bass and 800 trout  
H. 600 bass and 1,400 trout  
J. 800 bass and 1,000 trout  
K. 300 bass and 200 trout

---

53. A computer program generates a list of triples  $(a, b, c)$  such that

$a$ is an even number less than 16, $b$ is a perfect square, and $c$ is a multiple of 5 between $a$ and $b$ .
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Which of the following triples does not meet those conditions?

A. (14, 36, 25)  
B. (10, 25, 20)  
C. (6, 64, 50)  
D. (2, 25, 15)  
E. (2, 16, 12)

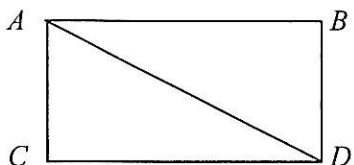
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54. If  $(y + 2)(5y - 2) = 0$  and  $y > 0$ , what is the value of  $y$ ?

F. 2  
G.  $\frac{5}{2}$   
H.  $\frac{2}{5}$   
J. 0  
K. -2

DO YOUR FIGURING HERE.

55. Given the sketch below, which of the following statements about rectangle  $ABDC$  is true?



- A.  $AB + BD > AD$   
 B.  $AB + BD < AD$   
 C.  $AB + BD = AD$   
 D.  $(AB)(BD) = AD$   
 E. A relationship cannot be determined.
- 
56. Given:  $4a + 5b - 6 = 0$  and  $4a - 2b + 8 = 0$ , what is the value of  $b$ ?

- F. -2  
 G.  $-\frac{1}{2}$   
 H. 0  
 J.  $\frac{1}{2}$   
 K. 2
- 

57. If the ordered pair  $(5, 4)$  is reflected across the  $y$ -axis and then reflected across the  $x$ -axis, what are the new coordinates of that point?

- A.  $(-5, -4)$   
 B.  $(-5, 4)$   
 C.  $(-4, -5)$   
 D.  $(5, -4)$   
 E.  $(4, 5)$
- 

58. A 45-rpm record revolves 45 times per minute. Through how many degrees will a point on the edge of the record move in 2 seconds?

- F. 180  
 G. 360  
 H. 540  
 J. 720  
 K. 930

**DO YOUR FIGURING HERE.**

59. If  $|x + 8| = 12$ , what is the value of  $x$  ?

- A. 4 only
  - B. 20 only
  - C. either -20 or 4
  - D. either -4 or 20
  - E. either 0 or 12
- 

60. Which of the following has the same result as reducing an item in price using successive discounts of 30% and 20%?

- F. multiplying the original price by 56%
  - G. dividing the original price by 50%
  - H. multiplying the original price by 44%
  - J. dividing the original price by 44%
  - K. either multiplying the original price by 50% or by 30% and then 20%
- 

**END OF PRACTICE TEST A**