

## General Instructions

Solve each problem and select the best answer from the choices.

### Important Notes:

1. No formulas or definitions of mathematical terms are provided.
2. Diagrams other than graphs are not necessarily drawn to scale.
3. Assume diagrams are in one plane, unless otherwise noted.
4. Graphs are drawn to scale. For example, lines that appear parallel on a graph are parallel.
5. Reduce all answers to simplest form.

1. For what value of  $x$  is  $3x - 8 = x$
2. There only blue marble to green marbles in a bag in a ratio of 5:7. How many blue marbles are in the bag if there are 132 marbles in the bag?
3. The area of a triangle is 16. What will the area be if the height and base were both doubled?
4. In a school of 2,000 students, 1,200 students are seniors and 1,500 students like watching comedies. What is the least number of students who are seniors and like watching comedies?
5. The sum of five consecutive numbers is 5. What is the greatest number of the five consecutive numbers?
6. The set of possible values of  $x$  is  $\{10, 13, 16\}$ . What is the set of possible values of  $y$  if  $3y = 2x - 5$ ?
  - A.  $\{5, 6, 7\}$
  - B.  $\{5, 7, 9\}$
  - C.  $\{5, 12, 14\}$
  - D.  $\{15, 21, 27\}$

7. One box contains 800 milligrams of sodium chloride. How many grams of sodium chloride are there in 12 of these boxes?

- A. 9.6 grams
- B. 96 grams
- C. 960 grams
- D. 9,600 grams

8. What is the greatest common factor of 90 and 126?

- A. 2
- B. 6
- C. 18
- D. 21

9. John, Mike and Lee each put in money toward buying a boat for \$24,000. John put in 3 times as much as Lee and Mike put in twice as much as Lee. How much money did Lee put in?

- A. \$2,000
- B. \$4,000
- C. \$8,000
- D. \$12,000

10. On a number line, point  $A$  is located at  $-3$ , and point  $B$  is located at  $12$ . Point  $P$  is  $\frac{2}{3}$  of the way from  $A$  to  $B$ . What is the coordinate of point  $P$ ?

- A.  $-1$
- B.  $2$
- C.  $6$
- D.  $10$

11. Express  $543.2 \times 1000$  in scientific notation

- A.  $5.432 \times 10^5$
- B.  $5.432 \times 10^4$
- C.  $54.32 \times 10^4$
- D.  $543.2 \times 10^3$

12. On a number line, points P and Q are 8 units apart. Point R is the midpoint of  $\overline{PQ}$ . Point V is the midpoint of  $\overline{PR}$  and is located at -3 on the number line. Where is the midpoint of  $\overline{VQ}$  located?

- A. -2
- B. -1
- C. 0
- D. 1

13. A hexagon has 2 sides that measure  $2x$  inches, 3 sides that measure  $3x$  inches, and one side that measures 15 inches. If the perimeter of the hexagon is 80 inches, what is the value of  $x$ ?

- A. 4
- B. 5
- C. 13
- D. 32

14. What is the value of  $-3|x| - 2|y|$  if  $x = -3$  and  $y = 5$ ?

- A. -19
- B. -11
- C. -14
- D. 1

15.  $\sqrt{36} + \sqrt{81} =$

- A.  $\sqrt{117}$
- B. 13
- C. 15
- D.  $\sqrt{15}$

16. An antivirus computer program automatically runs every 53 hours. If it first runs on Wednesday at 9am, when is the next time it will run?

- A. Thursday at 2pm
- B. Friday at 2am
- C. Friday at 2pm
- D. Friday at 4pm

17.  $x$  is a number in the set  $\{0.2, 0.3, 0.4, 1.1, 1.3\}$  and  $\frac{3.6}{.72}x$  is an integer. How many possible values of  $x$  are there?
- A. 0  
B. 1  
C. 2  
D. 3
18. How many numbers between 1 and 71, inclusive, have 2 as a factor but not 4?
- A. 17  
B. 18  
C. 30  
D. 35
19. If  $x$  is a prime number and  $20 < x < 30$ , what is the mean of all possible values of  $x$ ?
- A.  $24\frac{1}{3}$   
B. 25  
C. 26  
D.  $26\frac{1}{3}$
20. Rectangle ABCD is inscribed in circle O. If  $AD=3$  and  $AB=4$ , what is the circumference of circle O?
- A.  $5\pi$   
B.  $7\pi$   
C.  $10\pi$   
D.  $14\pi$
21. Jordan has 105 credits that can be used to listen to music online. If it costs 4 credits to listen to music each day, what is the maximum number of consecutive days that Jordan can listen to music online?
- A. 1  
B. 13  
C. 26  
D. 27

22. Mike is paid \$8.26 per hour for working as a teller in a bank. If he works  $5\frac{1}{2}$  hours each day, how much should he be paid for working 5 days?
- A. \$41.30
  - B. \$86.73
  - C. \$206.50
  - D. \$227.15
23. If  $x \rightarrow y \rightarrow z$  means add  $y$  to the product of  $x$  and  $z$ , what is the value of  $1 \rightarrow 2 \rightarrow 3$ ?
- A. 5
  - B. 6
  - C. 7
  - D. 8
24. If 17 out of 25 parents want the school trip to be at a museum, then what percent of the parents **do not** want the trip to be at a museum?
- A. 8%
  - B. 25%
  - C. 32%
  - D. 68%
25. The product of 3 different positive integers is 14. What is their sum?
- A. 9
  - B. 10
  - C. 14
  - D. 17
26. A circle has an area of  $q$  sq ft and a circumference of  $t$  ft. If  $q = 2t$ , what is the radius of the circle?
- A.  $\sqrt{2}$  ft
  - B. 2 ft
  - C. 4 ft
  - D.  $2\pi$  ft
27. If the perimeter of a rectangle is 8 times the width of the rectangle, then the length of the rectangle is how many times the width?
- A. 2
  - B. 3
  - C. 4
  - D. 8

28. For what positive value of  $x$ , does

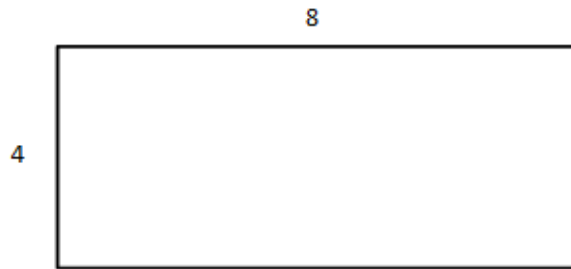
$$\frac{x}{9} = \frac{4}{x}$$

- A. 2
- B. 4
- C. 6
- D. 36

29. Five consecutive multiples of 6 have a sum of 240. What is the largest of these numbers?

- A. 24
- B. 36
- C. 54
- D. 60

30. What is the area, in square units, of a square that has the same perimeter as the rectangle below?



- A. 16
- B. 24
- C. 32
- D. 36

31. Sebastian is 7 years older than twice his brother's age. If his brother is 6 years old, how old is Sebastian?

- A. 19
- B. 16
- C. 14
- D. 12

32. A woman has won a \$10,000 prize and will share it with her family. She will give 30% to her husband and 20% split up evenly among her 4 children. How much money will each child get?

- A. \$20
- B. \$500
- C. \$1200
- D. \$2000

33.

**Visitors at a Zoo during an 11 Day Period**

| Day      | 1 | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 |
|----------|---|----|----|----|----|----|----|----|----|----|----|
| Visitors | 3 | 18 | 10 | 15 | 20 | 18 | 10 | 10 | 17 | 29 | 23 |

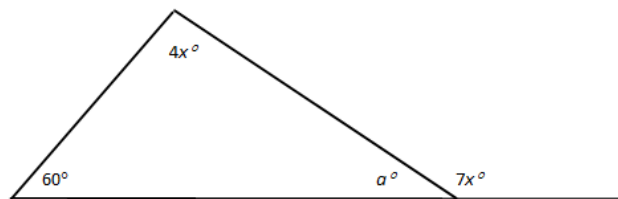
According to the table above, what is the median number of visitors to the zoo during the 11 days?

- A. 15
- B. 17
- C. 18
- D. 20

34. If  $x = 7$  and  $y = 6$ , what is the value of  $3x(y - x)$ ?

- A. -21
- B. 18
- C. 2
- D. 6174

35. What is the value of  $a$  in the figure below?



- A.  $20^\circ$
- B.  $30^\circ$
- C.  $40^\circ$
- D.  $60^\circ$

36. For what value of  $x$  is  $3(x - 2) = x + 4$  ?

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

37. The probability of drawing a blue marble from a hat of 10 marbles is  $\frac{3}{10}$ . How many blue marbles should be added to the hat to make the probability of drawing a blue marble  $\frac{1}{2}$ ?

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

38. Morgan has a take home test to complete. She completed  $\frac{1}{2}$  of the test on Monday and  $\frac{1}{5}$  on Tuesday. How much of her test does she have left to complete?

- A.  $\frac{1}{10}$
- B.  $\frac{2}{7}$
- C.  $\frac{4}{15}$
- D.  $\frac{9}{10}$

39. The volume of a cube is 8 cubic centimeters.

Each side of the cube is increased by 1 centimeter. What is the difference between the volume of the new cube and the volume of the old cube?

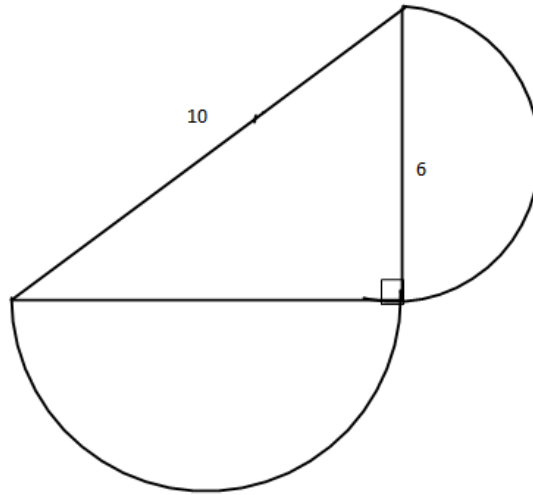
- A. 8 cu in
- B. 11 cu in
- C. 19 cu in
- D. 27 cu in

40. Bob has  $x$  baseball cards. Richard has 5 more than twice the amount of baseball cards as Bob. How many baseball cards do they have all together?

- A.  $5x$
- B.  $2x + 5$
- C.  $3x + 5$
- D.  $5x + 3$



41. The figure below is composed of two semi-circles and one triangle. What is the perimeter of the figure?



- A.  $6\pi + 10$
- B.  $7\pi + 10$
- C.  $14\pi + 7$
- D.  $14\pi + 10$

42. Julie is 3 times the age of Stephanie. If Stephanie's age will be 12 in 8 years, how old was Julie 2 years ago?

- A. 10
- B. 12
- C. 24
- D. 36

43. Jonathan is trying to save \$4,000. So far he saved 65% of his goal. How much more does he have to save?

- A. \$1,400
- B. \$2,000
- C. \$2,600
- D. \$2,800

44. A tennis ball company needs to package 214 balls. Each container can hold 6 balls. If each container is filled before the next one is filled, how many tennis balls will be in the last container?

- A. 0
- B. 2
- C. 4
- D. 35

45. Circle O is inscribed in square ABCD. If  $AB=6$  inches How much longer is the perimeter of square ABCD than the circumference of circle O?

- A.  $6 - 6\pi$  in
- B.  $6\pi$  in
- C.  $24 - 6\pi$  in
- D.  $24 - 36\pi$  in

46. If 5 gams equal 2 peds and 5 peds equal 3 rabs, how many gams equal 1 rab?

- A. 1
- B.  $\frac{5}{2}$
- C.  $\frac{25}{6}$
- D. 25

47. If  $x = -2$  and  $4x(2y + 5x) = 32$ , what is the value of  $y$ ?

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

48.

$$\frac{x}{a} = \frac{b}{x}$$

If  $a = 2$  and  $b = 8$ , what is the value of  $x$ ?

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

49. Point A is located at -10 and Point C is located at -1 on a number line.  $\overline{AB}$  is 7 units long and  $\overline{CD}$  is 10 units long. If  $B > A$  and  $D > C$ , what is the distance from the midpoint of  $\overline{AB}$  to the midpoint of  $\overline{CD}$ ?

- A. 4
- B. 6.5
- C. 10.5
- D. 17

50. William has  $x$  songs on his mp3 player and Chris has 110 more songs than 3 times as many songs as William. If Chris has 260 songs, how many songs does William have?

- A. 38
- B. 40
- C. 50
- D. 85

51. When each side of a square is increased by 2 units, the area is increased by 20 square units. What is the length of a side of the original square, in units?

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

52.

$$\left(\frac{2}{3} + \frac{1}{5}\right) \div \frac{3}{5} =$$

- A.  $\frac{1}{3}$
- B.  $\frac{13}{9}$
- C.  $\frac{13}{3}$
- D.  $\frac{45}{4}$

53. Mikayla scored a 98 on her first test and a 79 on her second test. What did she get on her third test if her average for the 3 tests was a 92?

- A. 92
- B. 95.5
- C. 96
- D. 99

54. A square is centered at the origin of a coordinate system so that each side is either parallel or perpendicular to the x-axis. One side of the square is 6 units long. What must be the coordinates of one corner of the square?

- A. (0, 0)
- B. (0, 6)
- C. (0, 3)
- D. (3, -3)

55. There were 6 black marbles, 5 red marbles and 3 green marbles in a jar. If 4 red marbles are removed from the jar, what is the probability that the next marble removed at random will be green?

- A.  $\frac{1}{10}$
- B.  $\frac{3}{10}$
- C.  $\frac{1}{14}$
- D.  $\frac{3}{14}$

56. A classroom had 1 foot of ribbon available for the students to use. Jasmine used 1 inch of ribbon and Hector used 3 inches of ribbon. What is the ratio of the amount of ribbon used to the amount of ribbon remaining?

- A. 1:4
- B. 3:1
- C. 1:12
- D. 1:2

57. If  $x$  is an even integer, which of the following cannot be an even integer?

- A.  $\frac{x}{2}$
- B.  $\frac{x}{3}$
- C.  $5(x + 2)$
- D.  $2x + 3$