

6th Grade Math Competition Written Test 2020

Name: _____

Date: _____

1. Which expression is equivalent to $8x - 2y + x + x$?

- A. $4x$ B. $8x$ C. $6x - 2y$ D. $10x - 2y$

2. What is the solution to the equation below?

$$4w = \frac{2}{3}$$

- A. $w = \frac{1}{6}$ B. $w = \frac{2}{7}$ C. $w = \frac{8}{3}$ D. $w = 3\frac{1}{3}$

3. A principal appointed a committee to decorate a row of lockers numbered 1 to 150. The committee decided to put

- a flower sticker on each 4th locker beginning with locker 4,
- a red band of color on each 10th locker beginning with locker 10, and
- a balloon sticker on each 15th locker beginning with locker 15.

How many lockers got all three decorations?

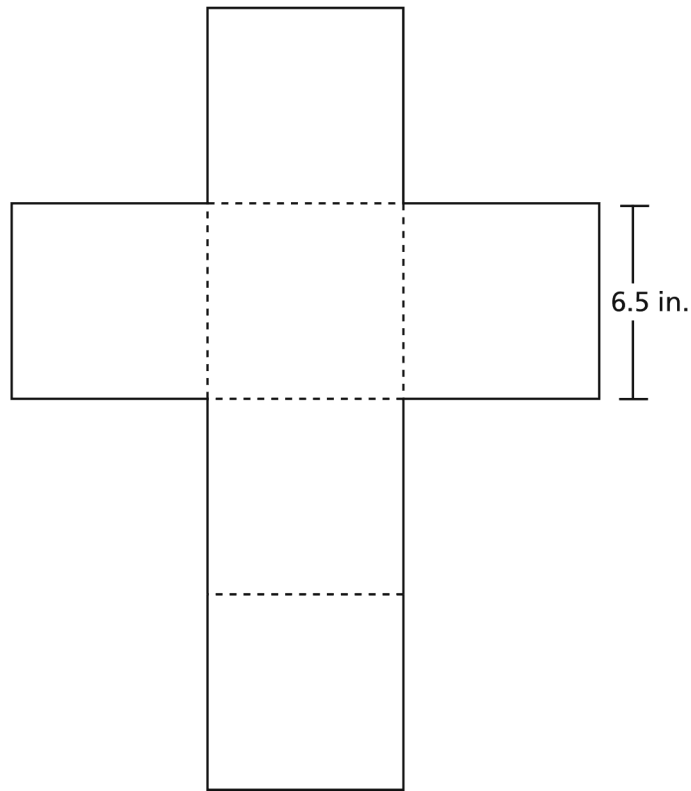
- A. 2 B. 6 C. 4 D. none

4. Which exponential expression is equivalent to $8 \times 8 \times 8 \times 8$?

- A. 4^4 B. 4^8 C. 8^4 D. 8^8

5. Kira decorates the exterior faces of a gift box in the shape of a cube. The figure below shows the net of the gift box.

NET OF KIRA'S GIFT BOX



What is the surface area, in square inches, of the gift box that Kira decorates?

- A. 91.0 B. 169.0 C. 253.5 D. 274.6
6. Which statement is true about the data set 7, 10, 6, 5, 4, 3, 7?
- A. mean = mode B. mean > mode
C. mean = median D. mean < median

7. What is the value of x in the equation below?

$$\frac{3}{5} = \frac{x}{30}$$

- A. 6 B. 9 C. 10 D. 18

8. Ms. Brown's car cost \$13,042.50. What digit is in the ten-thousands place in 13,042.50?

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

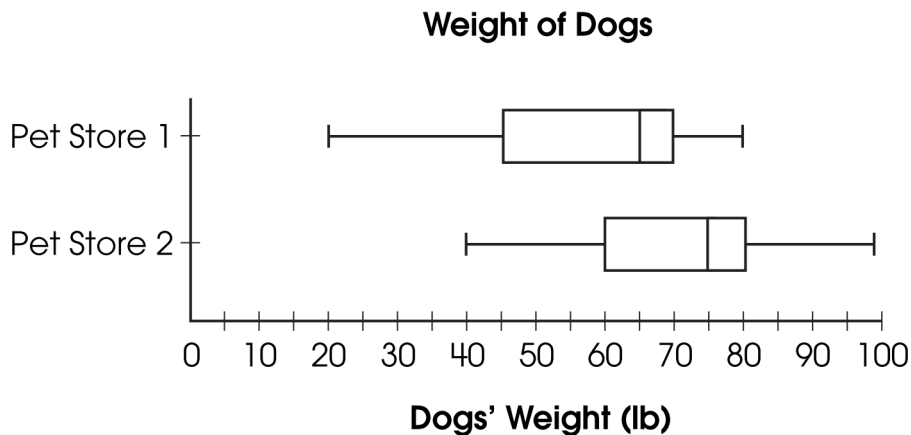
9. Cathleen planned to walk her dog for $\frac{3}{4}$ of a mile. After it started to rain, she decided to walk only $\frac{1}{2}$ of that distance. What fraction of a mile did Cathleen walk her dog?

- A. $\frac{1}{4}$ B. $\frac{3}{8}$ C. $\frac{2}{3}$ D. $\frac{1}{2}$

10. Mary picks 15 flowers from her garden. If 3 out of 5 of these flowers are yellow, how many yellow flowers does Mary pick?

- A. 3 B. 9 C. 12 D. 13

11. The box-and-whisker plots show the distribution of weight among dogs in two different pet stores.



How much greater is the median weight of the dogs in Pet Store 2 than in Pet Store 1?

- A. 5 B. 10 C. 15 D. 20
12. Max, Owen, Elise, and Cara went to a school carnival. They each played the dart throw, ring toss, water shoot, and basketball throw. Each student won a different game.

Clues:

- Max didn't score any points at the dart throw.
- Elise correctly tossed 2 rings, but did not win the ring toss.
- Cara won a bear for outscoring everyone at the water shoot.
- Owen scored more than anyone at the basketball throw.

Based on the clues, which game did Max win?

- A. dart throw B. ring toss
C. water shoot D. basketball throw

13. The number of feet in c inches is

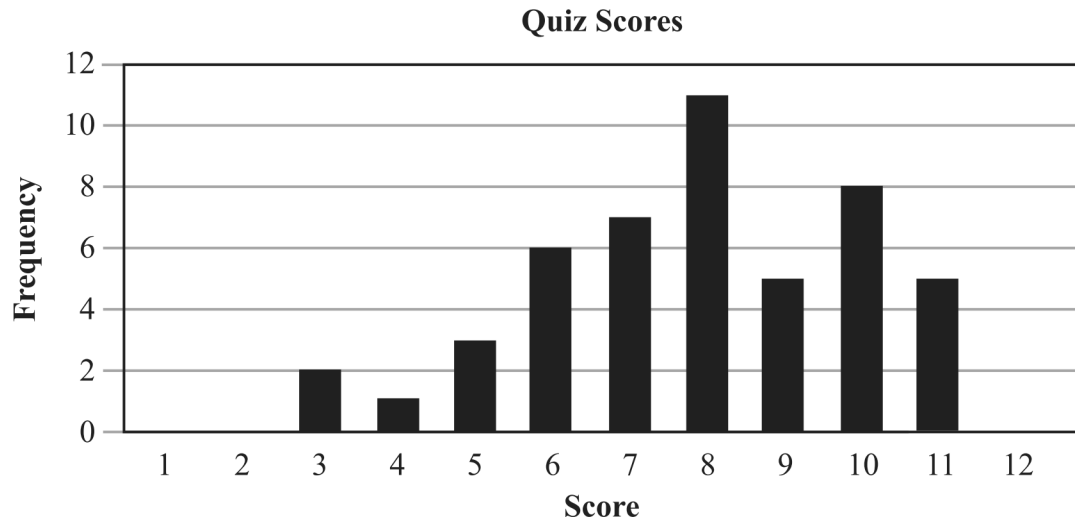
A. $\frac{c}{12}$

B. $\frac{c}{36}$

C. $\frac{12}{c}$

D. $12c$

14. The graph below shows quiz scores for Ms. Bryant's classes.



Which observation about this data is true?

A. The lowest score on the quiz was a 4.

B. There were 8 students who scored an 11.

C. There were 9 students who took the quiz.

D. There were 18 students who scored a 7 or an 8.

15. At a school costume party, seven girls wore masks and nine boys did not. If there were 15 boys at the party and 20 students did not wear masks, what was the total number of students at the party?

A. 30

B. 33

C. 35

D. 42

16. In Robert's class, $\frac{7}{10}$ of the students like to play sports, $\frac{4}{5}$ of the students like to watch television, and $\frac{3}{4}$ of the class like to listen to music. Robert wanted to list these interests of his classmates from the greatest number of students to the least. Which list should he make?

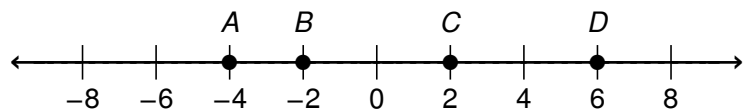
- A. playing sports, listening to music, watching television
- B. watching television, listening to music, playing sports
- C. listening to music, watching television, playing sports
- D. watching television, playing sports, listening to music

17. A sixth-grade class completed a survey about favorite foods. Of the students in the class, $\frac{1}{3}$ chose hamburgers, and $\frac{3}{8}$ chose pizza. What fraction of the class chose either hamburgers or pizza as the favorite food?

- A. $\frac{1}{24}$ B. $\frac{1}{8}$ C. $\frac{5}{14}$ D. $\frac{17}{24}$

18. Which point represents the number with the greatest absolute value?

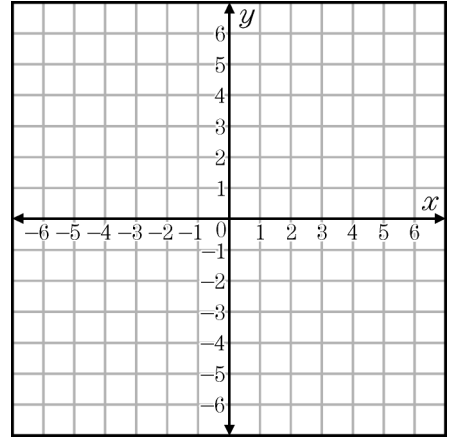
- A. *A* B. *B*
C. *C* D. *D*



19. What shape is made if you graph these points on a coordinate graph and connect the points?

$(2, 5), (2, -2), (-3, -2), (-3, 5)$

- A. square B. rectangle
C. trapezoid D. rhombus



20. Two figures are shown below. Each figure models a different equation. The equation $2w + 6 = 12$ is modeled by figure 1.

Figure 1: 

Figure 2: 

Which equation is modeled by figure 2?

- A. $4w = 7$ B. $w + 4 = 7$ C. $w + 3 = 7$ D. $3w + 4 = 7$
21. If four boxes of raisins cost x quarters, what is the cost, in cents, of one box?

- A. $\frac{25x}{4}$ B. $\frac{4}{25x}$ C. $\frac{x}{4}$ D. $4x$

22. Leo bought a used car for x dollars. One year later, the value of the car was $0.88x$. Which expression is another way to describe the change in the value of the car?

- A. 0.12% decrease B. 0.88% decrease
C. 12% decrease D. 88% decrease

23. Which expression represents the number of cents in d dimes and n nickels?

- A. $d + n$ B. $15(d + n)$ C. $10d + 5n$ D. $\frac{d}{10} + \frac{n}{5}$

24. Use the expression below to answer the question.

$$20 + 8y - 9y - 21$$

Which expression is equivalent?

- A. $2(10 + 4y - 7y - 19)$ B. $2(10 + 4y) - 3(3y - 7)$
C. $4(5 + 2y - 5y - 17)$ D. $4(5 + 2y) - 3(3y + 7)$

25. The length of a rectangular parking lot at the airport is $\frac{2}{3}$ mile. If the area is $\frac{1}{2}$ square mile, what is the width of the parking lot?

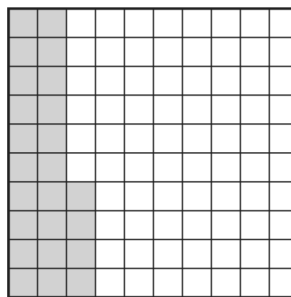
- A. $\frac{1}{3}$ mile B. $\frac{3}{4}$ mile C. $1\frac{1}{6}$ mile D. $1\frac{1}{3}$ mile

26. Tanya does push-ups and sit-ups every morning. She does p push-ups and $2p + 5$ sit-ups. Which statement describes the number of sit-ups Tanya does every morning?
- A. The number of sit-ups is 5 fewer than half the number of push-ups she does.
 - B. The number of sit-ups is 5 more than half the number of push-ups she does.
 - C. The number of sit-ups is 5 fewer than twice the number of push-ups she does.
 - D. The number of sit-ups is 5 more than twice the number of push-ups she does.
27. Mike is six years younger than his sister, Ann. In three years Ann will be twice as old as he. How old is Mike now?

- A. 9
- B. 1
- C. 6
- D. 3

28. Use the expression and unit grid below to answer the question.

$$0.24 \div 3$$

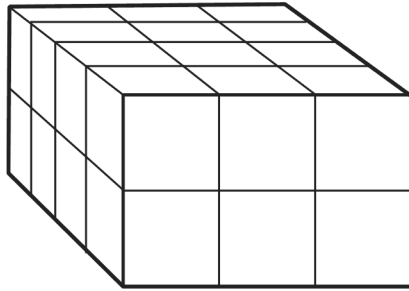


What is the value of the expression?

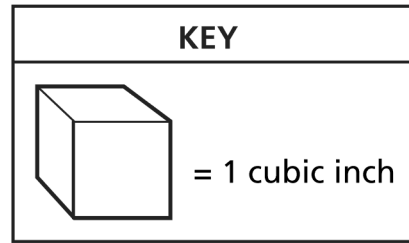
- A. 0.08
- B. 0.8
- C. 1.25
- D. 12.5

29. Rick's recorded times in four 1-mile runs are 4.8 minutes, 5.3 minutes, 4.7 minutes, and 5.4 minutes. For Rick's next run, which time will give him a mean of 5.0 minutes?
- A. 4.8 min B. 5.3 min C. 5.7 min D. 6.0 min

30. Brady stacked some blocks to form the rectangular prism below.



[not drawn to scale]



What is the volume of the rectangular prism?

- A. 9 cubic inches B. 18 cubic inches
 C. 24 cubic inches D. 32 cubic inches
31. Which operation should be performed first in the expression $18 - 2 + 5 \times (16 + 66 \div 2)$?
- A. $2 + 5$ B. 5×16 C. $16 + 66$ D. $66 \div 2$
32. The employees at Tony's company worked a total of 489,623 hours last year. The total amount paid to the employees was \$13,709,444.
- Which of the following is closest to the average amount paid per hour of work?
- A. \$10 B. \$20 C. \$30 D. \$40

33. What is the value of $\left(\frac{1}{8}\right)^2$?

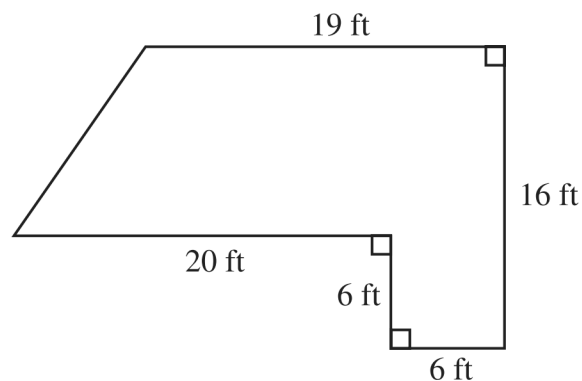
A. $\frac{1}{64}$

B. $\frac{1}{32}$

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

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

34. The picture below shows the shape of a design painted on the side of a building. The design was formed by combining triangles and rectangles.



What is the area of the wall covered by the design?

A. 261 ft^2

B. 296 ft^2

C. 321 ft^2

D. 424 ft^2

35. Kathy plans to run 6 miles in one hour. If she averages 4 mph for the first 3 miles, what speed must she average during the last 3 miles?

A. 6 mph

B. 8 mph

C. 10 mph

D. 12 mph

36. Evaluate: $12 - 4 \div 2^3 + 7 \times 0.5$

A. 15

B. 9

C. 4

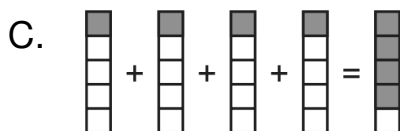
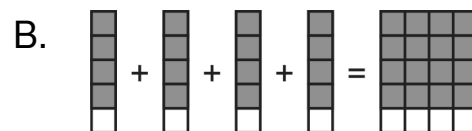
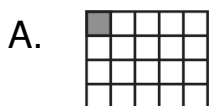
D. none of these

37. Brianna is planting flowers in her garden. Each row of flowers repeats in the sequence shown below.
- 2 mums
 - 3 zinnias
 - 4 snapdragons
 - 3 petunias
 - 2 daisies

Brianna has planted 38 flowers. Which type of flower will she plant next?

- A. zinnia B. snapdragon C. petunia D. daisy

38. Juanita spends 4 days raking leaves in a park. She rakes $\frac{1}{5}$ of park each day. After 4 days, she has raked $4 \times \frac{1}{5}$ of the park. Which fraction model can be used to find how much of the park Juanita has raked?



39. Jeremy is hosting a Halloween party for 80 children. He will give each child *at least* one candy bar. If each bag of candy contains 18 candy bars, which inequality can be used to determine how many bags, c , Jeremy will need to buy?

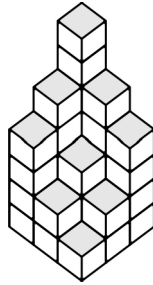
- A. $18c \geq 80$ B. $18c \leq 80$ C. $\frac{c}{18} \geq 80$ D. $\frac{c}{18} \leq 80$

40. Yolanda, Dana, and Julia ran a 200-meter race. The three girls attend Manchester, Allen, and Robles Middles Schools, in no particular order.
- Yolanda ran faster than Julia, but slower than the girl from Manchester Middle School.
 - The girl from Robles Middle School ran slower than the other two girls.

Which of the following lists the girls and the schools they attend in the order of fastest to slowest?

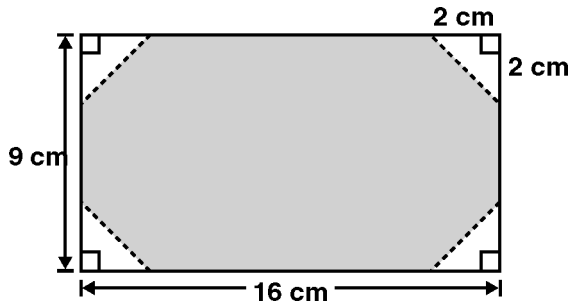
- A. Dana (Manchester), Yolanda (Allen), Julia (Robles)
- B. Yolanda (Allen), Julia (Manchester), Dana (Robles)
- C. Dana (Allen), Yolanda (Manchester), Julia (Robles)
- D. Julia (Robles), Dana (Allen), Yolanda (Manchester)
-
41. The first time Randy assembled a puzzle it took him 128 minutes. Each time after that, he assembled the puzzle in one-half of his previous time until he could assemble it every time in eight minutes. From start to finish, he assembled the puzzle 12 consecutive times. How many minutes did he spend assembling the puzzle 12 times?
- A. 304 B. $225\frac{15}{16}$ C. 1536 D. 316

42. The figure below is formed from unit cubes. The 3 faces of the figure that you cannot see are solid — no cubes are missing. What is the volume of the figure in cubic units?



- A. 27 cubic units B. 31 cubic units
C. 33 cubic units D. 35 cubic units
43. Wood floors are made with extra space so that the wood boards can expand during temperature changes. At a temperature of 72°F , a space of 2.5 mm is left between the wood boards. The space decreases by 0.04 mm for every 1°F increase in temperature.
- Which expression can be used to find the width of the space at temperature t in $^{\circ}\text{F}$?
- A. $2.5 - 0.04(t - 72)$ B. $(2.5 - 0.04)t$
C. $0.04(t - 72)$ D. $2.5 - 0.04t$
44. Timothy has a fish tank. He wants to know how much water it will take to fill it to $\frac{7}{8}$ of its capacity. He pours 20 quarts of water into the tank and realizes that it is $\frac{1}{8}$ full. How many gallons does he still need?
- A. $17\frac{1}{2}$ gallons B. $26\frac{1}{4}$ gallons C. 30 gallons D. 35 gallons

45. Cherie cut four congruent triangles off the corners of a rectangle to make an octagon, as shown below.



What is the area of the shaded octagon?

- A. 128 cm^2 B. 136 cm^2 C. 140 cm^2 D. 152 cm^2
46. Which procedure correctly simplifies the expression below?

$$-(x + 3) - 2(4x - 3)$$

- A. $-x - 3 - 8x + 6$
 $-9x + 3$
- B. $-x - 3 - 8x - 6$
 $-9x - 9$
- C. $-x + 3 - 8x + 6$
 $-9x + 9$
- D. $-x - 3 - 8x - 3$
 $-9x - 6$
47. From the information given in the table below use estimation to choose the brand with the lowest price per ounce.

Brand of soft drink	Price	Number of ounces
CC-cola	\$1.25	12 fl. oz. can
Peppy Soda	\$1.98	20 fl. oz. bottle
Sparkle	\$3.95	64 fl. oz. bottle
Queen Soda	\$5.25	6-pack of 12 fl. oz. cans

- A. CC-cola B. Peppy Soda
- C. Sparkle D. Queen Soda

48. Pam is playing with red and black marbles. The number of red marbles she has is three more than twice the number of black marbles she has. She has 42 marbles in all. How many red marbles does Pam have?

- A. 13 B. 15 C. 29 D. 33

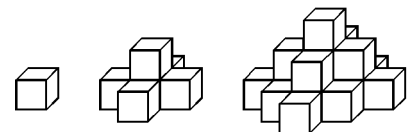
49. A group of fifth-graders were asked about their interest in music and dance. Of those who filled out the survey, 40 enjoy dancing, 55 enjoy listening to music, 16 enjoy both dancing and listening to music, and 3 enjoy neither.

How many fifth-graders filled out the survey?

- A. 111 B. 82 C. 114 D. 98

50. How many cubes will be in the next figure if the pattern continues?

- A. 25 B. 30 C. 36 D. 44



2020 Penny Sikes Math Competition
6th Grade Written Test Key

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

26. D
27. D
28. A
29. A
30. C
31. D
32. C
33. A
34. A
35. D
36. A
37. C
38. C
39. A
40. A
41. A
42. C
43. A
44. C
45. B
46. A
47. C
48. C
49. B
50. D