Beginning-of-Year Test
Multiple Choice

Name _____

8-2

Circle the best answer.

1. Simplify.

$$\frac{15(-3)}{5-(-10)}$$

A. -9 **B.** -3

C. 3 **D.** 9

2. Simplify.

$2^2 + (-8) \div 4$

F. 0 **G.** -1

H. 2 **J.** 6

3. Solve.

$y - 20 = -60$

A. $y = 80$

B. $y = 40$

C. $y = 3$

D. $y = -40$

4. Solve.

$\frac{m}{10} = -12$

F. $m = -120$

G. $m = -2$

H. $m = -1.2$

J. $m = 120$

5. Given $A = \ell w$, what is the area of a rectangle with a length of 12 feet and a width of 10 feet?

A. 2 ft^2

B. 44 ft^2

C. 120 ft^2

D. 1200 ft^2

6. Solve.

$-31 < g + 2$

F. $-33 > g$ **G.** $-33 < g$

H. $-29 < g$ **J.** $-29 > g$

7. Solve.

$\frac{b}{-2} \geq -8$

A. $b \geq 4$ **B.** $b \leq -4$

C. $b \geq 16$ **D.** $b \leq 16$

8. Which number is equivalent to $\frac{1}{5}$?

F. 5

G. 0.5

H. 0.2

J. 0.1

9. Simplify.

$\frac{1}{3} \cdot 3^{-1}$

A. -1

B. $\frac{1}{9}$

C. $\frac{1}{6}$

D. 1

10. Solve.

$63 = 8x - 9$

F. $x = 16.875$

G. $x = 9$

H. $x = 6.75$

J. $x = -9$

11. Simplify.

$\frac{3}{4} - \left(\frac{2}{3} + \frac{1}{6}\right)$

A. 0

B. $\frac{2}{7}$

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

D. $-\frac{1}{12}$

12. Simplify.

$\frac{1}{8} + 3\left(-\frac{3}{4}\right)$

F. $2\frac{3}{8}$

G. $-\frac{2}{3}$

H. $-2\frac{1}{8}$

J. $-2\frac{11}{32}$

13. Solve.

$1\frac{1}{9}y = 10$

A. $y = 11\frac{1}{9}$ **B.** $y = 9$

C. $y = 8\frac{8}{9}$ **D.** $y = \frac{1}{9}$

14. It rained 12 days out of 30 days. Which ratio compares the number of rainy days to the number of dry days?

F. $\frac{2}{5}$ **G.** 18 : 12

H. 12 : 30 **J.** 2 : 3

15. Solve.

$\frac{x}{76} = \frac{15}{19}$

A. $x = 1140$

B. $x = 96.27$

C. $x = 60$

D. $x = 0.27$

16. The scale on a map is 1 inch = 31.5 miles. What is the actual distance if the map distance is 3.5 inches?

F. 9 mi

G. 90 mi

H. 110.25 mi

J. not given

17. Lilly sold 43 of her 58 boxes of cookies. About what percent of her boxes were sold?

A. 0.74%

B. 0.26%

C. 26%

D. 74%

18. What is the percent of increase from 32 to 40?

F. 20% **G.** 25%

H. 80% **J.** 120%

19. The top five scores on the math test were 94, 100, 101, 90, and 90. What is the mean of this data?

A. 95 **B.** 94

C. 90 **D.** There is no mean.

20. Which best describes the purpose of a bar graph?

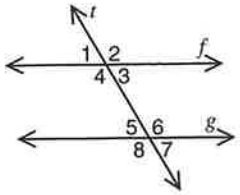
F. to display changes in data over time

G. to compare two or more sets of data

H. to represent how a whole is divided into parts

J. to show results of a survey

21. Line f is parallel to line g. If the measure of $\angle 1 = 48°$, what is the measure of $\angle 8$?



A. 42° **B.** 48°

C. 132° **D.** 138°

22. A right triangle contains an angle with a measure of 32°. What is the measure of the third angle?

F. 58° **G.** 74°

H. 148° **J.** not given

23. What is the area of a triangle with a base of 10 meters and a height of 5.5 meters?

A. 55 m^2

B. 31 m^2

C. 27.5 m^2

D. 13.75 m^2

24. What is the circumference of a circle with a radius of 10 inches? Use 3.14 for π.

F. 314 in. **G.** 62.8 in.

H. 31.4 in. **J.** 15.7 in.

25. What is the surface area of a rectangular prism that is 15 cm long, 5 cm wide, and 4 cm high? (*Hint:* $S = 2\ell w + 2\ell h + 2wh$)

A. 155 cm^2

B. 300 cm^2

C. 310 cm^2

D. 600 cm^2

26. A bag contains letter cards that spell the word ALGEBRA. What is the probability of picking a vowel card from the bag at random?

F. $\frac{1}{3}$ **G.** $\frac{3}{7}$

H. $\frac{4}{7}$ **J.** $\frac{3}{4}$

27. A pound of apples costs \$1.19. What function represents the relationship between weight in pounds (x) and cost (y)?

A. $y = 1.19$ **B.** $y = x + 1.19$

C. $y = 1.19x$ **D.** $y = 1.19x + 1$

28. Identify the expression.

$3x^2 - 2$

F. degree

G. monomial

H. binomial

J. trinomial

29. Evaluate $ac + 2b - 21$ when $a = -3$, $b = 12$, and $c = 1$.

A. -42 **B.** 0

C. 7 **D.** 41

30. Simplify.

$(3a)(2a^2) + (a^3 - 4a^2)$

F. $7a^3 - 4a^2$

G. $6a^6 - 4a^2$

H. $a^3 + 2a^2$

J. $3a$

31. Which statement is *not* true about constructing a multiple bar graph?

A. A key may be necessary.

B. Intervals can be small, if evenly spaced.

C. A broken scale is not allowed.

D. A title is not necessary.

32. The area of Marc's square garden is 225 ft^2. What are the dimensions of his garden?

F. 5 ft by 45 ft **G.** 12 ft by 12 ft

H. 15 ft by 15 ft **J.** not given

33. Jorge tips the waiter 20%. If the bill, before tip, comes to $25.50, what does Jorge pay including tip?

A. $0.51

B. $5.10

C. $26.01

D. $30.60

34. You are building a triangular pen for your pet pig. The first two sides must be 15 feet and 10 feet in length. Which of the following could be the length of the third side?

F. 3 ft **G.** 5 ft

H. 10 ft **J.** 35 ft

35. Stan buys a cylindrical can of paint. The height is 10 inches and the diameter is 6 inches. What is the volume of the can? Use 3.14 for π. (*Hint:* $V = \pi r^2 h$)

A. 94.2 $in.^3$ **B.** 282.6 $in.^3$

C. 376.8 $in.^3$ **D.** 1130.4 $in.^3$

36. A pile of cards contains 3 diamonds, 4 hearts, and 2 spades. Marianna randomly selects two cards without replacing the first. What is P(hearts, then spades)?

F. $\frac{8}{81}$

G. $\frac{1}{9}$

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

J. $\frac{1}{18}$

37. Leif has to choose two snacks for his lunch. His choices are raisins, apple, chips, carrots, and grapes. How many combinations could he have?

A. 120 **B.** 25

C. 10 **D.** 5

38. It costs $2.99 per pound for peppers and $1.49 for a mango. What function shows the total cost for peppers and a mango?

F. $y = 4.48$

G. $y = 4.48x$

H. $y = 2.99x + 1.49$

J. $y = 1.49x + 2.99$

39. A rectangle is 2 feet long and $(x + 10)$ feet wide. What is the area?

A. $(2x + 10)$ ft^2 **B.** $(2x + 20)$ ft^2

C. $(22x)$ ft^2 **D.** $(20x)$ ft^2

40. It costs $3.50 per hour to rent a bike, plus a flat fee of $5.50. If Juanita spends a total of $40.50, for how many hours did she rent the bike?

F. $4\frac{1}{2}$ h **G.** 7 h

H. 10 h **J.** 12 h

Name _____

Simplify.

1. $8(-3) + 14$

2. $3^2 - 2(-2) + 1$

3. 2^{-2}

Solve.

4. $-9x = 72$

5. $40 = \frac{x}{2}$

6. $c - 10 \geq 15$

7. $-45 < 9y$

8. $15x + 16 = -29$

9. $18 = -3y - 12$

Write each as a decimal.

10. $\frac{40}{100}$

11. $-\frac{3}{5}$

12. $2\frac{1}{8}$

Compute.

13. $\frac{3}{10} + \frac{3}{5} - \frac{1}{5}$

14. $1\frac{1}{4} \div \frac{1}{3}$

15. $3\left(2\frac{1}{2} - 1\right) + \frac{3}{10}$

Solve for x.

16. $3\frac{1}{3}x = 29$

17. $15 = \frac{20}{31}x$

Use the following information for questions 18 and 19.
Connor makes $120 for every 10 hours he works.

18. How much does Connor make per hour?

19. If Connor earns $300, how many hours has he worked?

Solve.

20. What is 9% of 25?

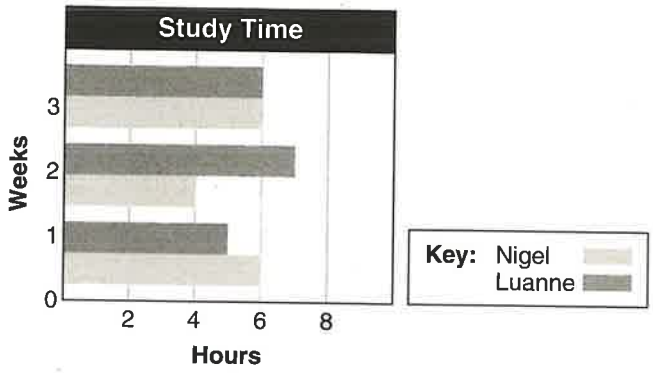
21. What is the percent of decrease from 125 to 25?

22. Sales tax is 10.25%. What is the tax on a $300 bill?

Use the graph to answer questions 23 and 24.

23. During which week did Nigel study more than Luanne? How much more?

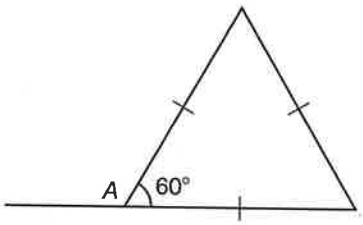
24. Over the three weeks, how many hours did Nigel study in all? Luanne?



Use the diagram for questions 25 and 26.

25. What is m$\angle A$?

26. Classify the triangle by its angles and sides.



Find the area of each figure to the nearest tenth. Use 3.14 for π.

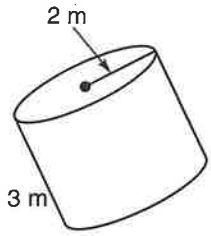
27. a rectangle with sides of 5 mm and 12 mm

28. a circle with a diameter of 18 m

29. a parallelogram with a base of 25 ft and a height of 20 ft

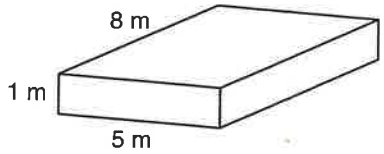
Find the surface area and volume of each figure using the given formulas.

30.



$S = 2\pi r^2 + 2\pi rh$
$V = \pi r^2 h$
Use 3.14 for π.

31.



$S = 2\ell w + 2\ell h + 2wh$
$V = \ell wh$

Write the probability of each event as a fraction, decimal, and percent.

32. $P(\text{D})$

33. $P(\text{not C})$

Write the probability of each compound event.
A bag contains 3 red marbles, 2 purple marbles, and 5 orange marbles.
Jamal picks two marbles from the bag at random.

34. P(purple, then orange) if the first marble picked is replaced in the bag

35. P(orange, then purple) if the first marble picked is not replaced in the bag

Find the slope of each line defined by the given points.

36. (0, 3) and (2, 0)

37. (−5, 20) and (−6, 10)

38. (−15, −1) and (8, −3)

Evaluate each expression for $a = 5$ and $b = -6$.

39. $a^2 - b + (10 \div a)$

40. $3a(b + a)$

41. $ab^2 + (a - b)^2$

Simplify.

42. $(3x + 14) + (19x - 35)$

43. $(5c^2 + c) - (3c^2 + 11c)$

44. $6y^3(3 + 4y^2)$

Solve.

45. $-7(2z + 4) = 21$

46. $9x - 5 = 16 + 2x$

47. $-8(7 - 4n) - 2n = 16 + 12n$

Solve. Show your work.

48. Ms. Costello borrows $5000 from a bank that charges 9.25% interest per year. What is her total amount due after one year?

49. The 8th grade sells popcorn after school. The 2-cup container is $0.89, the $2\frac{1}{2}$-cup container is $1.10, and the $3\frac{1}{2}$-cup container is $1.75. Which is the best buy?

50. The sweater Ingrid wants to buy is $30. It is on sale for 33% off. If the sales tax is 7%, what is the total cost of the sweater? Round to the nearest cent, if necessary.

51. Six friends play golf. Their scores are 87, 95, 92, 88, 91, and 96. What is the mean, median, and mode of the friends' scores?

52. The school's square parking lot has an area of 3025 ft^2. What is the length of each side of the parking lot?

53. Juana wants to use the numbers 8, 6, 3, and 2 to create her 4-digit ATM code. She will not repeat any digits. How many different codes could she create?

54. A classroom floor has an area of $(30x^3 + 8x^2)$ ft^2, with a width of $2x$ feet. What is the length of the floor?

55. Luis, Diego, and Cecil are going fishing. Luis brings 4 cans of worms. Diego brings 3 cans of worms plus 2 extra worms. Cecil brings 2 cans of worms. If they have a total of 65 worms and each can contains the same number of worms, how many worms are in each can?