Beginning-of-Year Test
Multiple Choice

Name _____

8-1

Circle the best answer.

1. What is the greatest common factor of 48 and 80?

A. 8

B. 12

C. 16

D. 240

2. Which numbers are in order from least to greatest?

F. $-\frac{1}{5}$, -0.16, $\frac{1}{6}$

G. -0.16, $-\frac{1}{5}$, $\frac{1}{6}$

H. $-\frac{1}{5}$, $\frac{1}{6}$, -0.16

J. -0.16, $\frac{1}{6}$, $-\frac{1}{5}$

3. Simplify.

$3 - 6 \bullet 9 + 6^2 \div 4$

A. -60

B. -42

C. 2.25

D. 10.25

4. What is the product in standard form?

$(3.5 \times 10^{-2})(5.3 \times 10^{5})$

F. 0.1855

G. 1.855

H. 185.5

J. 18,550

5. Simplify.

$\frac{\sqrt{25}}{\sqrt{64}} \bullet \sqrt{0.04}$

A. $\frac{1}{8}$

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

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

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

6. The legs of a right triangle are 8 cm and 12 cm. What is the length of the hypotenuse?

F. $4\sqrt{5}$ cm

G. $4\sqrt{13}$ cm

H. 40 cm

J. 208 cm

7. Solve.

$\frac{3x - 5}{7} = -x + 15$

A. $x = -25$

B. $x = -5$

C. $x = 2$

D. $x = 11$

8. What is $1.\overline{243}$ written as a fraction in lowest terms?

F. $1\frac{1}{243}$

G. $1\frac{6}{25}$

H. $1\frac{243}{1000}$

J. $1\frac{9}{37}$

9. What is the value of x if $|3x| - 15 = -6$?

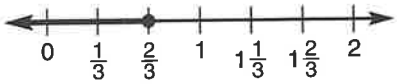
A. $x = 3$ or -3

B. $x = 3$ or -7

C. $x = 7$ or -7

D. $x = 9$ or -9

10. Which inequality is shown by the graph?



F. $x < \frac{2}{3}$

G. $x \leq \frac{2}{3}$

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

J. $x \geq \frac{2}{3}$

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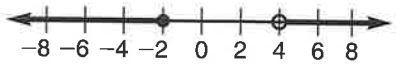
11. Solve.

$4 - 2(x + 6) > x + 10$

A. $x < -6$ **C.** $x < 2$

B. $x > -6$ **D.** $x > 2$

12. Which compound inequality is shown by the graph?



F. $n < -2$ or $n \geq 4$

G. $n \leq -2$ or $n > 4$

H. $n > -2$ and $n \leq 4$

J. $n \geq -2$ and $n < 4$

13. What is the quotient in standard form?

$$\frac{(4x^3y^2z)^3}{8x^6yz^3}$$

A. $1.5x^3y^5$

B. $1.5y^4z$

C. $8x^3y^5$

D. $8y^4z$

14. What is the difference in standard form?

$(2m^2 - 4m + 1) - (2m - 5 - 3m^2)$

F. $-m^2 - 6m - 4$

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

H. $5m^2 - 6m + 6$

J. $5m^4 - 6m^2 + 6$

15. What is the slope of the line that passes through the points $(-8, 7)$ and $(4, -9)$?

A. $-\frac{4}{3}$ **C.** $-\frac{3}{4}$

B. $-\frac{13}{15}$ **D.** $-\frac{1}{6}$

16. What is the solution to this system?

$$\begin{cases} y = -4x + 3 \\ y = 2x - 12 \end{cases}$$

F. $(-2.5, 13)$ **H.** $(2.5, -7)$

G. $(1.5, -3)$ **J.** $(3.75, -4.5)$

17. Solve for n.

$$\frac{8.8}{3.2} = \frac{3.3}{n}$$

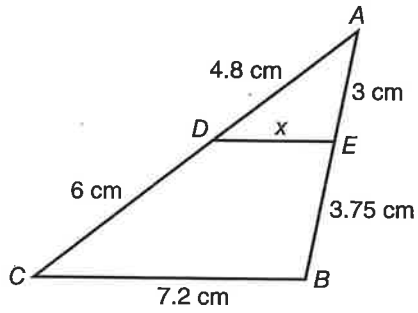
A. $n = 0.8\overline{3}$

B. $n = 1.2$

C. $n = 2.3$

D. $n = 9.075$

18. $\triangle AED$ is similar to $\triangle ABC$. What is the value of x?



F. $x = 3.2$

G. $x = 3.75$

H. $x = 5.76$

J. $x = 6$

19. What percent of 104 is 65? Round to the nearest tenth.

A. 1.6%

B. 6.3%

C. 16%

D. 62.5%

20. What is the simple interest rate if \$3500 invested for 5 years earns \$420?

F. 1.7% **H.** 6%

G. 2.4% **J.** 12%

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21. Angles J and K are vertical angles. $\angle J$ is the supplement to an 82° angle. What is the measure of $\angle K$?

A. 8°

B. 82°

C. 98°

D. 172°

22. Twenty-eight out of 112 students are in band. How many degrees of a circle graph would represent these students?

F. 25°

G. 28°

H. 90°

J. 144°

23. What is the area of a circle that has a circumference of 56.52 cm? Use 3.14 for π.

A. 254.34 cm^2

B. 324 cm^2

C. 1017.36 cm^2

D. 31,945.10 cm^2

24. If $f(x) = 3 - 2x$ and $g(x) = 2x + 3$, what is the value of $f(-1) \cdot g(-2)$?

F. −35 **H.** 1

G. −5 **J.** 7

25. If x varies inversely with y when $x = 18$ and $y = 10$, what is x when $y = 36$?

A. 5 **C.** 20

B. 8 **D.** 64.8

26. What is the surface area of a square pyramid that has a base of 6 meters by 6 meters and a slant height of 9 meters?

F. 102 m^2

G. 108 m^2

H. 144 m^2

J. 150 m^2

27. What is the volume of a cylinder that has a radius of 7 inches and a height of 8 inches? Use 3.14 for π.

A. 307.72 $in.^3$

B. 351.68 $in.^3$

C. 659.4 $in.^3$

D. 1230.88 $in.^3$

28. The heights in inches of the players on the basketball team are 65, 66, 65, 70, 69, 63, 68, and 62. What is the mean of their heights?

F. 8 in.

G. 65 in.

H. 65.5 in.

J. 66 in.

29. What is the probability of picking an S or a vowel from the word QUESTIONS?

A. $\frac{1}{9}$ **C.** $\frac{4}{9}$

B. $\frac{2}{9}$ **D.** $\frac{2}{3}$

30. A smoothie shop offers 12 different flavors of juice. How many ways can they make a smoothie containing 2 different types of juice?

F. 24 **H.** 72

G. 66 **J.** 132

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31. The diagonal of a square is 18 inches long. What is the area of the square?

A. $9\sqrt{2}$ in.^{2}

B. 72 in.^{2}

C. 162 in.^{2}

D. 324 in.^{2}

32. Which statement is true of the rotated image of a scalene triangle?

F. It is a reflection of the original triangle.

G. The area is two times the area of original triangle.

H. It becomes an isosceles triangle.

J. Its perimeter is the same as that of the original triangle.

33. The product of three factors is $x^3 - 15x^2 - 54x$. What are the factors?

A. $x(x - 18)(x + 3)$

B. $x(x - 9)(x - 6)$

C. $x(x - 9)(x + 6)$

D. $x(x + 18)(x - 3)$

34. What type of graph best displays the temperatures taken each hour during the day?

F. line graph

G. box-and-whisker plot

H. circle graph

J. stem-and-leaf plot

35. Number cubes have faces labeled 1, 2, 3, 4, 5, and 6. What is the probability of rolling two cubes that total 5?

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

B. $\frac{1}{5}$

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

D. $\frac{5}{6}$

36. The dimensions of a box are 20 cm by 20 cm by 20 cm. A cylinder has a diameter of 20 cm and a height of 20 cm. What is the difference between the volume of the box and the volume of the cylinder? Use 3.14 for π.

F. They have the same volume.

G. 516 cm^3

H. 1720 cm^3

J. 17,120 cm^3

37. A swimming pool that is 6 meters wide and 12 meters long is surrounded by a cement walkway that is 1.5 meters wide. What is the area of the space that is taken up by the pool and the walkway?

A. 48 m^2

B. 63 m^2

C. 101.25 m^2

D. 135 m^2

38. At 7 P.M., the temperature is 15°C. It drops 3° each hour until 1 A.M. What is the temperature at 1 A.M.?

F. −6°C

G. −3°C

H. 3°C

J. 30°C

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Name _____

Find the greatest common factor (GCF) and the least common multiple (LCM).

1. 45 and 18

2. 100 and 175

3. 35 and 12

Order from least to greatest.

4. $-0.57, -\frac{5}{8}, -\frac{5}{9}$

5. 1.7, 1.75, 1.69, 2

6. $\frac{14}{5}, \sqrt{15}, 2.48$

Simplify.

7. $\frac{-3^4 + 6 \cdot 2}{3} + \frac{(-3)^4 + 6 \cdot 2}{3}$

8. $\left(\frac{2}{3} \cdot \frac{3}{4}\right)^2 - 5 + \left(\frac{5}{2} \cdot \frac{3}{10}\right)$

9. $\sqrt{1.96} + (0.6)^2$

Multiply or divide.

10. $(3.7 \times 10^5)(2.4 \times 10^2)$

11. $\frac{3.84 \times 10^{12}}{5.12 \times 10^8}$

12. $(4.5 \times 10^{-7})(3.2 \times 10^4)$

Solve.

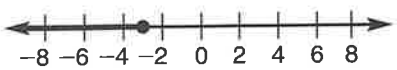
13. $\frac{3}{10}(x + 7) = -\frac{3}{5}$

14. $\left|\frac{a}{2} - 3\right| = 5$

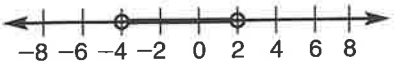
15. $3 - \frac{1}{2}y \leq 2y + 7$

Write an inequality or compound inequality for each graph.

16.



17.



Rename each decimal as a fraction or mixed number in lowest terms.

18. $2.8\overline{3}$

19. $5.\overline{18}$

20. $5.1\overline{8}$

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Find the difference or product. Write each answer in standard form.

21. $(3x^4 - 4x^2) - (2x^3 - x^4)$

22. $-2x^2y(7x^2y + 5xy^2 - 3xy)$

23. $(4n - 5)(5n + 4)$

Use the given information to write an equation of the line in slope-intercept form.

24. slope $m = -\frac{3}{2}$; passes through $(6, -2)$

25. contains points $(-5, 3)$ and $(1, -3)$

26. parallel to the line $4x - 2y = 7$ and passes through point $(-3, 4)$

Solve for x.

27. $\frac{2x + 6}{3} = \frac{5}{4}$

28. $\frac{\$13.20}{5 \text{ ft}} = \frac{x \text{ dollars}}{1 \text{ in.}}$

29. *scale:* 3 cm : x mi
scale measure: 7.5 cm
actual measure: 125 mi

Find the missing value.

30. 175% of 200 is what number?

31. 25 is what percent of 25,000?

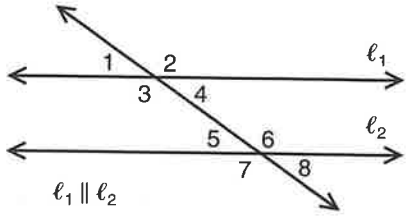
32. 18 is 24% of what number?

33. Price: \$98.50
Tax Rate: 6.2%
Sales Tax: ?

34. Original: \$9.25
New: \$9.62
Percent Change: ?

35. Simple Interest: \$50.25
Rate: 3%
Time: 30 months
Principal: ?

Use the diagram at the right to answer questions 36–38.



36. Which pairs of angles are corresponding angles?

37. Which pairs of angles are alternate interior angles?

38. If $m\angle 3 = 153°$, what is $m\angle 4$?

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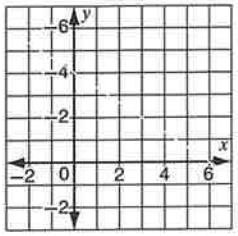
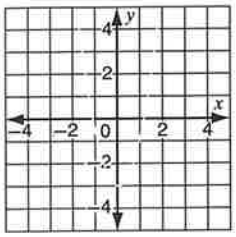
Graph each function.

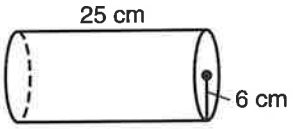
39. $f(x) = -\frac{2}{3}x + 4$



40. $f(x) = 2x^2 - 3$



Use the figure at the right for exercises 41–43. Use 3.14 for π.



41. Name the solid figure.

_____

42. Find the surface area of the figure.

_____

43. Find the volume of the figure.

_____

On a sheet of paper, make a stem-and-leaf plot to represent the data below. Use it for exercises 45–47.

44. Minutes to complete a puzzle:
32, 37, 38, 21, 29, 26, 24, 19, 32, 28, 32, 16, 10, 22, 15, 26, 24, and 10

45. What is the mean? Round to the nearest tenth.

_____

46. What is (are) the mode(s)?

_____

47. What is the median?

_____

A 1 through 6 number cube is rolled. Express each probability as a percent.

48. $P(2 \text{ or } 5)$

_____

49. $P(\text{number} < 10)$

_____

50. The cube is rolled twice. $P(\text{even and then 2 or 4})$

_____

Write the converse of each statement.

51. If the battery is not charged, then my cell phone does not work.

_____

52. If a square has sides that are 10 cm long, then the square has an area of 100 cm^2.

_____

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Solve. Show your work.

53. Amanda wants to pay the same amount each month on her car loan. The number of payments varies inversely with the monthly payment amount. If each monthly payment is $175, she makes 48 payments. How much would her monthly payment be if she wanted to pay off the loan in 30 months?

54. Matt's test scores are 98%, 86%, 78%, 99%, and 20%. Which measure of central tendency would you use if you wanted to describe his typical test score?

55. The area of a trapezoid can be found using the formula $A = \frac{1}{2}h(b_1 + b_2)$ in which A stands for the area, h for the height, and b_1 and b_2 for the lengths of the bases. A certain trapezoid has an area of 240 cm^2 and a height of 12 cm. If the length of one base is 25 cm, what is the length of the other base?

56. A ladder is needed to reach the top of a 60-foot building. If the base of the ladder is to be placed 11 feet from the building, how long must the ladder be?

57. Jacques is standing 1200 meters from a cliff he is planning to climb. The angle of elevation from the ground to the top of the cliff is 35°. To the nearest meter, how tall is the cliff?

58. A sandwich shop offers 4 types of bread, 5 types of meat, and 3 types of cheese. Find the number of possible sandwich choices if a customer is offered a choice of bread, meat, and cheese.

59. A sound system originally priced at $480 is on sale for 20% off. The tax on the purchase after the discount is 7.5%. What is the total cost of the sound system including tax?

60. Steve's lawn is 60 feet long and 40 feet wide. He would like to reduce its size to one half its original area. If he reduces the width to 30 feet, what should the new length be?

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