

Name: _____

Date: _____

10.EE.7_b solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and combining like terms

3.EE.1 apply and know the properties of integer exponents to generate equivalent numerical expressions.

6.EE.4 add, subtract, multiply, and divide numbers expressed in scientific notation, including problems where both decimal and scientific notation are used; interpret and use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g. use millimeters per year for seafloor spreading); interpret scientific notation that has been generated by technology (e.g. calculators)

20. simplify, add, subtract, multiply, and divide radical expression to include rationalizing the denominator.

27.G.7 apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

1. What is the value of the expression?

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

- A. $-\frac{1}{4}$ B. 1 C. $\frac{2}{3}$ D. 5

2. $\sqrt{16} + \sqrt[3]{8} =$

- A. 4 B. 6 C. 9 D. 10

3. Which of the following is closest to the value of $\frac{7 - \sqrt{2}}{2}$?

- A. 1.1 B. 2.8 C. 6.0 D. 6.3

4. Simplify: $9\sqrt{32} - 3\sqrt{18} + 6\sqrt{50}$

- A. $-75\sqrt{2}$ B. $-57\sqrt{2}$ C. $57\sqrt{2}$ D. $75\sqrt{2}$

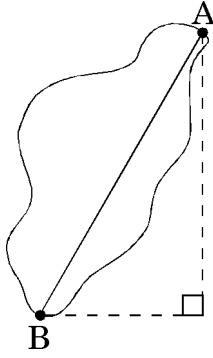
5. What is the value of the expression $(\sqrt{12})^2 - \sqrt{12^2 + 5^2}$?

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

6. Simplify: $\frac{4 - \sqrt{3}}{2 - \sqrt{3}}$

- A. 2 B. $5 + 2\sqrt{3}$
C. $11 - 6\sqrt{3}$ D. $-11 + 6\sqrt{3}$

7. Jean used the Pythagorean Theorem to determine the distance in feet from point A to point B across the lake.



If the length of \overline{AB} is equal to the square root of 3,000, what is true about this distance?

- A. It is between 30 feet and 31 feet.
- B. It is between 40 feet and 50 feet.
- C. It is between 54 feet and 55 feet.
- D. It is between 55 feet and 56 feet.

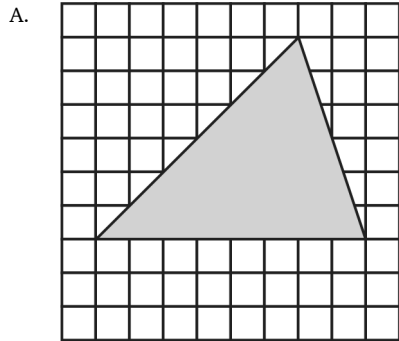
8. The diagonal of a square is 25 units long. Which is the approximate length of a side of the square?

- A. 18 units
- B. 15 units
- C. 5 units
- D. 13 units

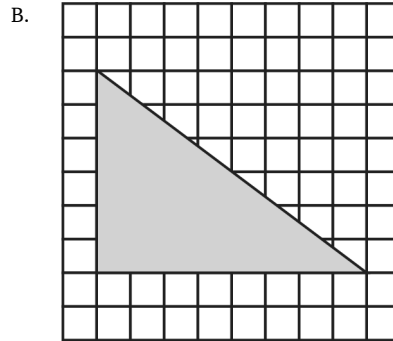
9. Harry drew a right triangle on a grid. Some of the properties of his triangle are listed below.

- The length of the triangle's hypotenuse is 10 units.
- The triangle has a leg that is 8 units.

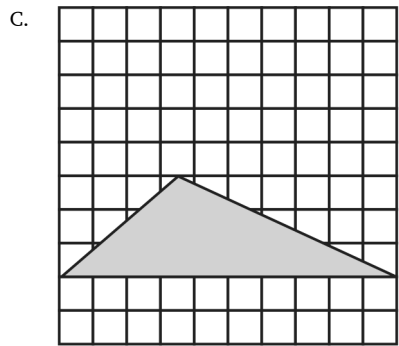
According to the information given, which of the following best represents the triangle?



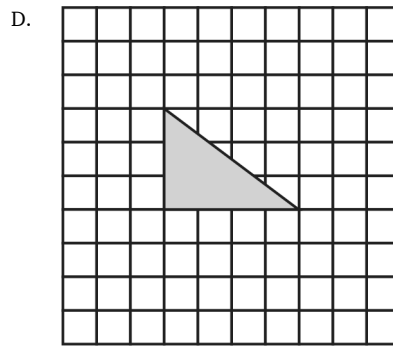
Each \square represents 1 unit



Each \square represents 1 unit

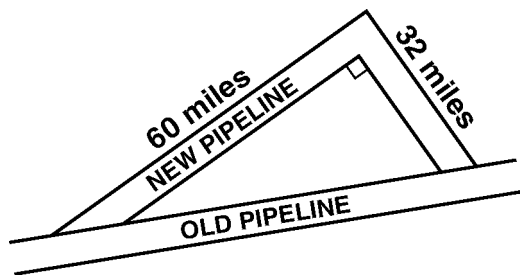


Each \square represents 1 unit



Each \square represents 1 unit

10. A new pipeline is being constructed to re-route its oil flow around the exterior of a national wildlife preserve. The plan showing the old pipeline and the new route is shown below.



About how many extra miles will the oil flow once the new route is established?

- A. 24 B. 68 C. 92 D. 160
11. Mr. Smith and Ms. Jones start at the same place. Mr. Smith drives north for 4 miles. Ms. Jones drives east for 5 miles. What is the direct distance between Mr. Smith and Ms. Jones?
- A. $\sqrt{18}$ miles B. $\sqrt{41}$ miles
C. 9 miles D. 41 miles
12. The diagonal of a square television screen measures 27 inches. What is the *approximate* length of the screen?
- A. 13 in. B. 15 in. C. 19 in. D. 21 in.
13. Which expression shows another way to write $(4^3)^3$?
- A. 4^{3-3} B. $4^{3\div 3}$ C. 4^{3+3} D. $4^{3\times 3}$

14. What is the value of $\frac{4^3 \cdot 4^{-1} \cdot 5^{-2}}{4^4 \cdot 5^{-3} \cdot 5^0}$?

15. What is the value of $2^0 + 2^{-1} + 2^{-2}$?

- A. -6 B. 2^{-3} C. $1\frac{3}{4}$ D. 7

16. Which expression is equivalent to $(x^{\frac{1}{3}})^{-3}$?

- A. \sqrt{x} B. $\frac{1}{x}$ C. $\frac{1}{x^9}$ D. $\frac{1}{x^{27}}$

17. Which of the following has the same value as $5^6 \times 5^{-2}$?

- A. 5^{-12} B. 5^{-3} C. 5^4 D. 5^8

18. Which expression is equivalent to $(9^{-2})^8$?

- A. -81^{32} B. $\frac{1}{9^{16}}$ C. $\frac{1}{9^{10}}$ D. 81^8

19. Neptune's distance from the sun is about 2.8×10^9 miles. Earth's distance from the sun is about 30 times shorter. What is Earth's approximate distance, in miles, from the sun?

- A. 5.8×10^7 B. 5.8×10^8
 C. 9.3×10^7 D. 9.3×10^8

20. An astronomer measures four distances:

- distance P = 2.1×10^{18} kilometers
- distance Q = 4.2×10^{36} kilometers
- distance R = 8.4×10^{18} kilometers
- distance S = 8.4×10^{36} kilometers

Which statement about these distances is correct?

- A. Distance Q is twice as great as distance P.
 B. Distance R is twice as great as distance Q.
 C. Distance S is twice as great as distance Q.
 D. Distance S is twice as great as distance R.

21. A company used about 7.4×10^5 sheets of paper in a month. Of the paper used during the month, the accounting department used about 8.9×10^3 of the sheets. About how many sheets of paper were used by other departments during the month?

- A. 1.5×10^2 B. 1.5×10^3
 C. 7.3×10^4 D. 7.3×10^5

22. The approximate lengths of two major rivers are listed below.

- Nile River: 2.2×10^7 feet
- Snake River: 5.5×10^6 feet

Based on these lengths, the length of the Nile River is how many times the length of the Snake River?

- A. 0.4 B. 2.5 C. 4 D. 25

23. Simplify.

$$\frac{1.2 \times 10^{-6}}{4.8 \times 10^4}$$

- A. 2.5×10^{-2} B. 2.5×10^{-9}
 C. 2.5×10^{-10} D. 2.5×10^{-11}

24. Two numbers are written in scientific notation as follows: 7.3×10^n and 1.2×10^q . What is the product of the two numbers?

- A. $7.3 \times 1.2 \times 10^{n+q}$ B. $7.3 \times 1.2 \times 100^{n+q}$
 C. $7.3 \times 1.2 \times 10^{nq}$ D. $7.3 \times 1.2 \times 100^{nq}$

25. What is the solution to the equation?

$$\frac{7}{2}x - 2 = 28 - 4x$$

- A. $x = 0$ B. $x = \frac{2}{7}$ C. $x = 4$ D. $x = 7$

26. Which of the following is a correct procedure for solving the equation below?

$$2(x - 6) - 12 = -3(x + 5)$$

- A. $2(x - 6) - 12 = -3(x + 5)$
 $2x - 6 - 12 = -3x + 5$
 $2x - 18 = -3x + 5$
 $5x - 18 = 5$
 $5x = 23$
 $x = \frac{23}{5}$
- B. $2(x - 6) - 12 = -3(x + 5)$
 $2x - 12 - 12 = -3x + 15$
 $2x = -3x + 15$
 $5x = 15$
 $x = 3$
- C. $2(x - 6) - 12 = -3(x + 5)$
 $2x - 12 - 12 = -3x - 15$
 $2x - 24 = -3x - 15$
 $5x - 24 = -15$
 $5x = -39$
 $x = \frac{39}{5}$
- D. $2(x - 6) - 12 = -3(x + 5)$
 $2x - 12 - 12 = -3x - 15$
 $2x - 24 = -3x - 15$
 $5x - 24 = -15$
 $5x = 9$
 $x = \frac{9}{5}$

27. For a wedding, Shereda bought several dozen roses and several dozen carnations. The roses cost \$15 per dozen, and the carnations cost \$8 per dozen. Shereda bought a total of 17 dozen flowers and paid a total of \$192. How many roses did she buy?
- A. 6 dozen B. 7 dozen C. 8 dozen D. 9 dozen

28. What is the solution to the equation below?

$$3(x - 4) = 5x - 6$$

- A. $x = -3$ B. $x = \frac{3}{4}$ C. $x = 1$ D. $x = 9$

29. What is the solution to the equation below?

$$\frac{x}{4} = \frac{x + 1}{3}$$

- A. $x = -4$ B. $x = -1$ C. $x = \frac{1}{7}$ D. $x = \frac{4}{7}$

30. Mark returned a video 3 days late and paid \$6 in late charges. Linda returned a video 5 days late and paid \$10. Their friend Eric returned a video 9 days late. How much did Eric pay in late charges?
- A. \$4 B. \$8 C. \$14 D. \$18

1.
Answer: D
2.
Answer: B
3.
Answer: B
4.
Answer: C
5.
Answer: B
6.
Answer: B
7.
Answer: C
8.
Answer: A
9.
Answer: B
10.
Answer: A
11.
Answer: B
12.
Answer: C
13.
Answer: D
14.
Answer: 0.3125
15.
Answer: C
16.
Answer: B
17.
Answer: C
18.
Answer: B
19.
Answer: C
20.
Answer: C

21.
Answer: D
22.
Answer: C
23.
Answer: D
24.
Answer: A
25.
Answer: C
26.
Answer: D
27.
Answer: C
28.
Answer: A
29.
Answer: A
30.
Answer: D