Name _____ Date _____

Remember to show all of your work on a separate sheet(s)

Answers

Tell whether the two fractions form a proportion.

1. $\dfrac{3}{4}, \dfrac{16}{20}$ **2.** $\dfrac{5}{7}, \dfrac{30}{42}$ **3.** $\dfrac{4}{18}, \dfrac{6}{27}$

4. Use the ratio table to find the unit rate in dollars per ounce.

Amount (ounces)	12	16	20	24
Cost (dollars)	0.96	1.28	1.6	1.92

Order the numbers from least to greatest.

5. $\left|-5\right|, 6, -6, -\left|4\right|, -2$ **6.** $\dfrac{15}{2}, -8.5, -\dfrac{42}{5}, 10.2$

Solve the inequality.

7. $4x < 24$ **8.** $x + 8 \geq 12$

9. What is the volume of the prism?

5 cm

3 cm

4 cm
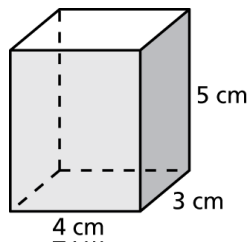
10. A map has a scale of 1 in. : 10 mi. On the map, the distance between two cities is 5 inches. What is the actual distance between the cities?

Simplify the expression.

11. $-4 + 11$ **12.** $-6 - 9$ **13.** $-7(-8)$

14. $60 \div (-4)$ **15.** $\left|-34\right|$ **16.** $\left|-(-41)\right|$

17. $17(-14)$ **18.** $12 - (-19)$ **19.** $\dfrac{4}{15} + \dfrac{5}{9}$

20. $-\dfrac{7}{8} \div \dfrac{3}{4}$ **21.** $\dfrac{13}{18} \bullet \dfrac{9}{25}$ **22.** $-\dfrac{7}{12} - \dfrac{1}{8}$

23. $(0.6)^2$ **24.** $8.37(-5.3)$ **25.** $0.95 - 3.49$

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

Name_____ Date_____

8 (continued)

26. The length and the width of a rectangle are both doubled. What is the ratio of the area of the larger rectangle to the area of the smaller rectangle?

Solve the equation.

27. $7 + x = -2$ **28.** $8 - x = 13$ **29.** $x - 11 = -5$

30. $3x - 2 = -5$ **31.** $8x + 5 = 21$ **32.** $9 - 2x = 23$

33. Use the properties of equality to show that the equation $6x + 3 = 27$ is equivalent to the equation $2x = 8$.
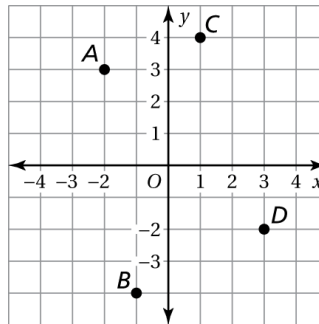
Find the coordinates of the point.

34. A **35.** B

36. C **37.** D

Complete the statement using $<$, $>$, or $=$.

38. 1 in. ____ 2.54 cm   **39.** 40 in. ____ 1 m   **40.** 7 L ____ 2 gal

Write the fraction as a decimal.

41. $\dfrac{3}{4}$ **42.** $\dfrac{5}{16}$ **43.** $\dfrac{21}{4}$

44. In a class, the teacher asks each person wearing red to name his or her favorite color. Is this sample representative of the entire class? Explain.

45. The data below are the test scores of the students in a math class.

97, 76, 84, 82, 90, 95, 77, 79, 80, 82, 84, 77, 100, 78, 87

Create a stem-and-leaf plot to represent the data.

46. Each of the letters in the word MATHEMATICS are written on separate index cards. The cards are then placed in a hat. What is the probability of randomly drawing an index card with a vowel on it from the hat?

Answers

26. _____

27. _____

28. _____

29. _____

30. _____

31. _____

32. _____

33. _____

34. _____

35. _____

36. _____

37. _____

38. ____See left.____

39. ____See left.____

40. ____See left.____

41. _____

42. _____

43. _____

44. _____

_____

_____

45. ____See left.____

46. _____

Mathematics Reference Sheet

Conversions

U.S. Customary
1 foot = 12 inches
1 yard = 3 feet
1 mile = 5280 feet
1 acre ≈ 43,560 square feet
1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts
1 gallon = 231 cubic inches
1 pound = 16 ounces
1 ton = 2000 pounds
1 cubic foot ≈ 7.5 gallons

U.S. Customary to Metric
1 inch = 2.54 centimeters
1 foot ≈ 0.3 meter
1 mile ≈ 1.61 kilometers
1 quart ≈ 0.95 liter
1 gallon ≈ 3.79 liters
1 cup ≈ 237 milliliters
1 pound ≈ 0.45 kilogram
1 ounce ≈ 28.3 grams
1 gallon ≈ 3785 cubic centimeters

Time
1 minute = 60 seconds
1 hour = 60 minutes
1 hour = 3600 seconds
1 year = 52 weeks

Temperature
$$C = \frac{5}{9}(F - 32)$$

$$F = \frac{9}{5}C + 32$$

Metric
1 centimeter = 10 millimeters
1 meter = 100 centimeters
1 kilometer = 1000 meters
1 liter = 1000 milliliters
1 kiloliter = 1000 liters
1 milliliter = 1 cubic centimeter
1 liter = 1000 cubic centimeters
1 cubic millimeter = 0.001 milliliter
1 gram = 1000 milligrams
1 kilogram = 1000 grams

Metric to U.S. Customary
1 centimeter ≈ 0.39 inch
1 meter ≈ 3.28 feet
1 kilometer ≈ 0.62 mile
1 liter ≈ 1.06 quarts
1 liter ≈ 0.26 gallon
1 kilogram ≈ 2.2 pounds
1 gram ≈ 0.035 ounce
1 cubic meter ≈ 264 gallon

Number Properties

Commutative Properties of Addition and Multiplication

$$a + b = b + a$$
$$a \cdot b = b \cdot a$$

Associative Properties of Addition and Multiplication

$$(a + b) + c = a + (b + c)$$
$$(a \cdot b) \cdot c = a \cdot (b \cdot c)$$

Addition Property of Zero

$$a + 0 = a$$

Multiplication Properties of Zero and One

$$a \cdot 0 = 0$$
$$a \cdot 1 = a$$

Distributive Property:

$$a(b + c) = ab + ac$$
$$a(b - c) = ab - ac$$

Properties of Equality

Addition Property of Equality

If $a = b$, then $a + c = b + c$.

Subtraction Property of Equality

If $a = b$, then $a - c = b - c$.

Multiplication Property of Equality

If $a = b$, then $a \cdot c = b \cdot c$.

Multiplicative Inverse Property

$$n \cdot \frac{1}{n} = \frac{1}{n} \cdot n = 1, n \neq 0$$

Division Property of Equality

If $a = b$, then $a \div c = b \div c, c \neq 0$.

Squaring both sides of an equation

If $a = b$, then $a^2 = b^2$.

Cubing both sides of an equation

If $a = b$, then $a^3 = b^3$.

Properties of Exponents

Product of Powers Property: $a^m \cdot a^n = a^{m+n}$

Quotient of Powers Property: $\dfrac{a^m}{a^n} = a^{m-n}, a \neq 0$

Power of a Power Property: $(a^m)^n = a^{mn}$

Power of a Product Property: $(ab)^m = a^m b^m$

Zero Exponents: $a^0 = 1, a \neq 0$

Negative Exponents: $a^{-n} = \dfrac{1}{a^n}, a \neq 0$

Slope

$m = \dfrac{rise}{run}$

$= \dfrac{\text{change in } y}{\text{change in } x}$

$= \dfrac{y_2 - y_1}{x_2 - x_1}$

Equations of Lines
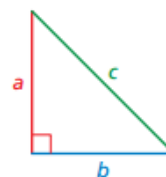
Slope-intercept form
$y = mx + b$

Standard form
$ax + by = c, a, b \neq 0$

Point-slope form
$y - y_1 = m(x - x_1)$

Pythagorean Theorem
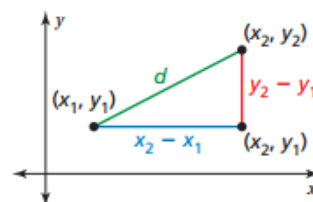
$a^2 + b^2 = c^2$

Converse of the Pythagorean Theorem

If the equation $a^2 + b^2 = c^2$ is true for the side lengths of a triangle, then the triangle is a right triangle.
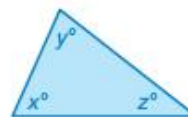
Distance Formula

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Angles of Polygons

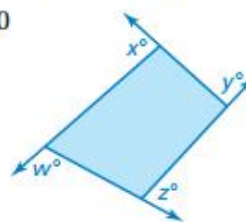### Interior Angle Measures of a Triangle

$x + y + z = 180$

Interior Angle Measures of a Polygon

The sum S of the interior angle measures of a polygon with n sides is $S = (n - 2) \cdot 180°$.

Exterior Angle Measures of a Polygon

$w + x + y + z = 360$

Volume

Cylinder

$V = Bh = \pi r^2 h$

Cone

$V = \dfrac{1}{3}Bh = \dfrac{1}{3}\pi r^2 h$

Sphere

$V = \dfrac{4}{3}\pi r^3$