



SAGEMONT

PREPARATORY SCHOOL

Mathematics Summer Packet Students Entering Geometry 30 Points

Evaluate Algebraic Expressions

Evaluate each expression.

1. $2x + 6$ for $x = 12$

2. $-3x - 5$ for $x = 18$

3. $\frac{1}{5}x + 14$ for $x = 20$

4. $\frac{x}{2} \cdot 16$ for $x = 5$

5. $\frac{2}{x-1} + 4$ for $x = 0$

6. $x^2 - 4x$ for $x = -1$

Square Roots and Cube Roots

Evaluate each expression.

7. $\sqrt[3]{216}$

8. $\sqrt{169}$

9. $\sqrt{225}$

10. $\sqrt{\frac{49}{144}}$

11. $\sqrt[3]{27}$

12. $\sqrt[3]{125}$

Properties of Exponents

Simplify each expression.

13. $3^4 \cdot 3^5$

15. $5^5 \div 5^2$

17. $\frac{6^7}{6^5}$

14. $(2 \cdot 3)^2$

16. $(4^2)^3$

18. $8\left(\frac{1}{2}\right)^4$

Simplify Algebraic Expressions

Simplify each expression.

1. $(4x - 1) + (2x + 3)$

3. $2(6n + 4) - 5n$

2. $(1 + 3y) - (2 - 5y)$

4. $-8x - 3(2x - 1)$

Solve Two-Step Equations

Solve each equation.

5. $3b + 4 = -8$

7. $-\frac{1}{4}s - \frac{3}{2} = \frac{3}{4}$

6. $106 = 43 + 7x$

8. $2m + 1.5 = -11.7$

Write Two-Step Inequalities

Write an inequality to model each situation.

Bob has two 8-foot sections of prebuilt fencing left over from a previous fencing project. He plans to buy s 6-foot sections of the fencing so that he will have more than 40 feet of fencing.

Vijay has loaded 35 pounds of soil onto a cart. He will add b bricks that each weigh 4 pounds, but he does not want to exceed a total weight of 100 pounds in the cart.

Ana is baking cookies for a cookie exchange. She has already baked 20 cookies, and she will bake 1 dozen cookies at a time in each of the next b batches. She wants to take at least 50 cookies to the exchange.

1. Lisa takes 27 minutes to run 3 miles.
 - A. Write Lisa's unit rate in minutes per mile.
 - B. Write Lisa's unit rate in miles per minute.
 - C. At this rate, how many miles will Lisa have run after 45 minutes?
 - D. At this rate, how long would it take Lisa to run 7 miles?

2. A 5-pound bag of carrots costs \$2.69, and a 2-pound bag costs \$1.89.
 - A. Which bag provides a greater weight per dollar spent?
 - B. How much does 10 pounds of carrots cost when purchasing 5-pound bags?
 - C. How much does 10 pounds of carrots cost when purchasing 2-pound bags?
 - D. What is the difference in price between each option when purchasing 10 pounds of carrots?

Solve Two-Step Equations

Solve each equation.

3. $5x + 2 = 9$

5. $2(x + 1) = 10$

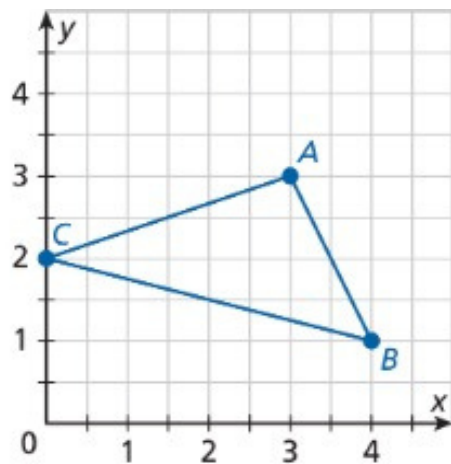
4. $\frac{2}{3}x - 3 = -7$

6. $\frac{4}{5}(15x - 1) = -8$

Translate Figures in the Coordinate Plane

Identify the coordinates of $\triangle ABC$ under each translation.

- 2 units down
- 3 units to the right and 4 units down
- 2 units to the left and 1 unit up



Evaluate Algebraic Expressions

Evaluate each expression for the given information.

1. $x = 5, y = -5$

$$6x + 4y = \underline{\quad ? \quad}$$

2. $x = \frac{1}{2}, y = 4$

$$3x + 6y = \underline{\quad ? \quad}$$

Slopes of Lines

Find the slope of the line passing through the two points on the line.

3. $(1, 2)$ and $(5, 1)$

4. $(-1, -3)$ and $(2, 6)$

5. $(4, 3)$ and $(6, -2)$

6. $(-2, -2)$ and $(-8, -14)$

Point-Slope Form

Write the equation of a line in point-slope form using the given information.

7. slope, $m = 3$, passing through the point $(6, 8)$

8. slope, $m = -2$, passing through the point $(2, 3)$

9. passing through the points $(1, 2)$ and $(0, 8)$

Represent Equations with Tables and Graphs

For each equation, create a table with 3 points and then graph the equation.

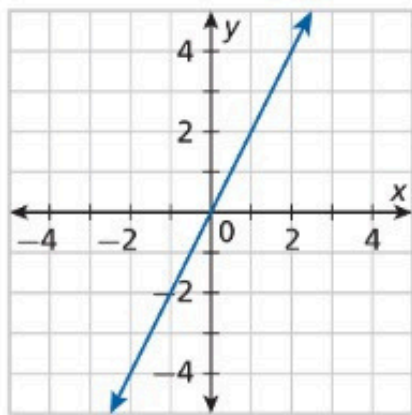
1. $y = x - 2$

2. $y = -\frac{5}{2}x$

Compare Proportional Relationships

For each pair of models, state which model represents the lesser unit rate.

3. $y = 3x$



4. $y = 1.5x$

x	y
3	5
6	10
9	15
12	20

Find and Interpret Absolute Values of Numbers

Determine the absolute value of the following numbers.

1. -5
2. 0
3. 11
4. $-\pi$
5. The state of California requires that hot food being served at any facility over a period of time be held at a temperature of 135°F or higher before food is removed from the temperature control to be served. If the holding oven used has a tolerance of 2°F and shows a temperature of 138°F , is the holding temperature within the state requirement?
6. The length of a bolt should be 18.0 cm. The allowable range of bolt length is from 17.5 cm to 18.5 cm. What is the tolerance of the bolt length?

Solve Two-Step Inequalities

Find the solution for each two-step inequality.

7. $2x - 1 \geq 9$
8. $\frac{x - 4}{5} > 8$
9. $3x + 6 < -15$
10. $\frac{x + 3}{4} \leq -2$

Graph Linear Equations in Slope-Intercept Form

Create a graph for each given function.

11. $y = -2x - 3$
12. $y = 3x + 1$
13. $y = \frac{1}{3}x + 2$
14. $y = -\frac{2}{5}x + 10$

Add and Subtract Rational Numbers

Simplify each expression.

1. $-\frac{1}{2} + \frac{5}{6}$

3. $1.24 + 6.52$

5. $\frac{2}{9} + \frac{1}{5}$

2. $-1.24 - 2.54$

4. $\frac{3}{4} - \frac{7}{8}$

6. $5.81 - 9.1$

Multiply and Divide Rational Numbers

Simplify each expression.

7. $\left(\frac{1}{2}\right)\left(\frac{7}{8}\right)$

9. $378 \div 5$

11. $\left(-\frac{2}{3}\right)\left(\frac{9}{13}\right)$

8. $1.11(0.5)$

10. $\frac{3}{5} \div \frac{7}{8}$

12. $0.0768 \div 0.024$

Evaluate Algebraic Expressions

Evaluate the expression for the given information.

13. $-3 + 5(n - 1)$ for $n = 6$

15. $-5 - 7(n - 1)$ for $n = 10$

17. $2(n + 1) - 12$ for $n = 5$

14. $2 - 6(n + 2)$ for $n = 3$

16. $2 + 3(n - 8)$ for $n = 20$

18. $-3(n - 3) + 3$ for $n = -3$