Name_____ Date_____

Incoming Algebra Student Summer Packet

Multiply and Divide Rational Numbers

Simplify each expression.

1. $1\frac{1}{4} \cdot 2\frac{1}{8}$

2. $-3.01(-2.3)$

3. $4^2 \div 2$

4. $1\frac{2}{5} \div \frac{3}{8}$

5. $0.22 \cdot 6$

6. $\frac{5}{4} \div \frac{1}{2}$

The Distributive Property

Simplify each expression.

7. $5(2+3)-6$

8. $2+3(6-8)$

9. $4(x+y)$

10. $2(x+4)-2$

11. $-2(3-2x)+6$

12. $-5(3x+1)+8x$

Properties of Exponents

Simplify each expression.

13. $3^2 \cdot 3^3$

14. $2^2 \cdot 3^{-2}$

15. $\frac{4^4}{4^2} \cdot 1^7$

16. $\frac{4^5}{4^2} \cdot 4^4$

17. $3\left(\frac{2}{3}\right)^3$

18. $-3(-3)^{-3}$

Solve Two-Step Inequalities

Solve each inequality and graph the solution on a number line.

1. $6+\frac{x}{2} > 10$

2. $-2+\frac{x}{3} \leq 6$

Name_____ Date_____

Simplify Algebraic Expressions

Simplify each expression.

1. $-2x + 5x + 3$

2. $-x + 6 + (-2x)$

3. $1.5x + 7 + 2.5x$

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

5. $4(x - 1) - 8$

6. $-2(2x + 1) + 7x$

7. $3(x + 4) + 4(x + 3)$

8. $-5(x - 2) + 2(x + 6)$

Math Equation

Represent Equations with Tables and Graphs

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

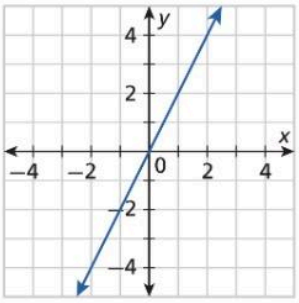
1. $y = x - 2$

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

Name_____ Date_____

Write Equations for Proportional Relationships

Write an equation that describes each relationship.

1. The number of students whom Ian tutors is proportional to the amount that he earns as shown in the table.

Number of students, x	5	7	9
Amount earned ($), y	150	210	270

2. Kim drives 144 miles every 3 hours.

Slopes of Lines

Determine the slope of a line passing through each pair of points.

3. $(0, 0)$ and $(6, 3)$

4. $(2, 1)$ and $(-8, 5)$

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

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

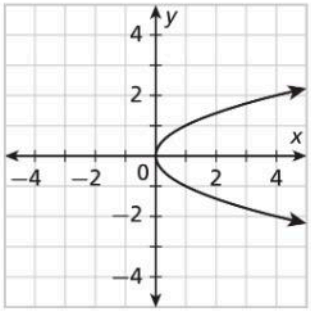
Understand Functions

Determine if each relation is a function

7.

Hour	Temperature, °C
10	5
16	8
20	5

8.



Name_____ Date_____

Find Unit Rates

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. $5x + 2 = 9$

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

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

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

Graph $y = mx$

Graph each equation.

7. $y = 3x$

8. $y = \frac{4}{5}x$

9. $y = -2x$

10. $y = -1.5x$

Name_____ Date_____

Simplify Algebraic Expressions

Simplify each expression.

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

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

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

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

Solve Two-Step Equations

Solve each equation.

5. $3b + 4 = -8$

6. $106 = 43 + 7x$

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

8. $2m + 1.5 = -11.7$

Write Two-Step Inequalities

Write an inequality to model each situation.

9. 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.

10. 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.

11. 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.

Name_____ Date_____

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. $3^4 \cdot 3^5$

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

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

16. $(4^2)^3$

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

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