What procedures can be used to write and solve equations and inequalities?

Vocabulary Review

Complete each definition with a vocabulary word.

> **Vocabulary** dependent variable   independent variable   inequality   equation

1. In the equation $y = x + 9$, the variable x is the _____.

2. A(n) _____ has an infinite number of solutions.

3. In the equation $y = x - 9$, the variable y is the _____.

Draw a line from each equation to the property of equality it illustrates.

4. $(6 + 3) - 3 = 9 - 3$ Addition Property of Equality

5. $(6 + 3) \times 3 = 9 \times 3$ Division Property of Equality

6. $(6 + 3) + 3 = 9 + 3$ Multiplication Property of Equality

7. $(6 + 3) \div 3 = 9 \div 3$ Subtraction Property of Equality

Use Vocabulary in Writing

Describe how to solve $\frac{3}{7}n = 27$. Use vocabulary words in your explanation.

Concepts and Skills Review

Understand Equations and Solutions

Quick Review

The solution of an equation makes the equation true. Substitute each of the given values into the equation for the variable to determine which value, if any, is a solution of the equation.

Example

Which value of x is a solution of the equation?

$x + 4.8 = 19$ $x = 13, 14.2, 15.8$

Try $x = 13$: $13 + 4.8 \neq 17.8$ ✗
Try $x = 14.2$: $14.2 + 4.8 = 19$ ✓
Try $x = 15.8$: $15.8 + 4.8 \neq 20.6$ ✗

Practice

Tell which value of the variable, if any, is a solution of the equation.

1. $d + 9 = 25$ $d = 6, 14, 16, 21$

2. $c - 8 = 25$ $c = 17, 28, 33, 35$

3. $2y = 30$ $y = 10, 12, 24, 36$

4. $150 \div h = 50$ $h = 2, 3, 4, 5$

5. $f - 13.2 = 28.9$ $f = 38.7, 42.2, 45.8, 51.4$

Apply Properties of Equality

Quick Review

The properties of equality allow you to apply the same operation with the same amount to both sides of an equation.

Example

The properties of equality are illustrated in the table.

Properties of Equality	
Addition Property of Equality	$4 + 3 = 7$ So, $4 + 3 + 2 = 7 + 2$
Subtraction Property of Equality	$9 + 8 = 17$ So, $9 + 8 - 5 = 17 - 5$
Multiplication Property of Equality	$3 \times 5 = 15$ So, $3 \times 5 \times 2 = 15 \times 2$
Division Property of Equality	$16 + 2 = 18$ So, $(16 + 2) \div 2 = 18 \div 2$

Practice

1. If $6 + 2 = 8$, does $6 + 2 + 3 = 8 + 3$? Why or why not?

2. If $8 - 1 = 7$, does $8 - 1 - 2 = 7 - 3$? Why or why not?

3. If $4 + 6 = 10$, does $(4 + 6) \times 3 = 10 \times 3$? Why or why not?

4. If $5 + 4 = 9$, does $(5 + 4) \div 3 = 9 \div 4$? Why or why not?

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