Concepts and Skills Review

LESSON 4-1 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?

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

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

Practice

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

1. $d + 9 = 25$ $\quad d = 6, 14, 16, 21$
2. $c - 8 = 25$ $\quad c = 17, 28, 33, 35$
3. $2y = 30$ $\quad y = 10, 12, 24, 36$
4. $150 \div h = 50$ $\quad h = 2, 3, 4, 5$
5. $f - 13.2 = 28.9$ $\quad f = 38.7, 42.2, 45.8, 51.4$

LESSON 4-2 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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LESSONS 4-3 AND 4-4 Write and Solve Addition, Subtraction, Multiplication, and Division Equations

Quick Review

Use the inverse relationship of addition and subtraction or multiplication and division to solve equations. To check, substitute your answer back into the original equation.

Example

$23 + y = 57$

$23 + y - 23 = 57 - 23$

$y = 34$

$a - 12 = 16$

$a - 12 + 12 = 16 + 12$

$a = 28$

$9z = 63$

$9z \div 9 = 63 \div 9$

$z = 7$

$c \div 4 = 24$

$c \div 4 \times 4 = 24 \times 4$

$c = 96$

Practice

Solve for x.

1. $8x = 64$
2. $x + 2 = 11$
3. $x \div 20 = 120$
4. $x - 17 = 13$
5. $x \div 12 = 2$
6. $8 + x = 25$
7. $7x = 77$
8. $x - 236 = 450$
9. $26 = 13x$
10. $x + 21.9 = 27.1$
11. $2{,}448 \div 48 = x$
12. $x + 15 = 31$

LESSON 4-5 Write and Solve Equations with Rational Numbers

Quick Review

You can use inverse relationships and properties of equality to solve each equation.

Example

Solve $w + 4\frac{1}{3} = 7$.

Subtract $4\frac{1}{3}$ from both sides.

$w + 4\frac{1}{3} - 4\frac{1}{3} = 7 - 4\frac{1}{3}$

$w = 2\frac{2}{3}$

Solve $\frac{3}{5}n = \frac{2}{3}$.

Multiply both sides by the reciprocal of $\frac{3}{5}$.

$\frac{5}{3} \times \frac{3}{5}n = \frac{5}{3} \times \frac{2}{3}$

$n = \frac{10}{9}$ or $1\frac{1}{9}$

Practice

In 1–8, solve for x.

1. $x + 3\frac{5}{8} = 7\frac{1}{4}$
2. $x - \frac{4}{8} = 4\frac{1}{4}$
3. $x \div 15 = 8\frac{1}{3}$
4. $\frac{4}{2}x = 6$
5. $\frac{x}{3} = 9$
6. $14x = 73.5$
7. $12x = 19.2$
8. $17.9 - x = 12.8$
9. Tomas buys a bag of 5 peaches for \$3.55. Write and solve an equation to find how much money, m, Tomas paid for each peach.
10. Krys has \$1.54 and spends \$0.76. Write and solve an equation to find how much money, m, Krys has left.