Name _____ Date _____

Solving Linear Equations

To determine whether a value is a solution of an equation, substitute the value into the equation and simplify.

Example 1 **Determine whether (a) $x = 1$ or (b) $x = -2$ is a solution of $5x - 1 = 4$.**

a. $5x - 1 = -2x + 6$

$5(1) - 1 \stackrel{?}{=} -2(1) + 6$ Substitute.

$4 = 4$ ✓ Simplify.

▶ So, $x = 1$ is a solution.

b. $5x - 1 = -2x + 6$

$5(-2) - 1 \stackrel{?}{=} -2(-2) + 6$ Substitute.

$-11 \neq 10$ ✗ Simplify.

▶ So, $x = -2$ is *not* a solution.

To solve a linear equation, isolate the variable.

Example 2 **Solve each equation. Check your solution.**

a. $4x - 3 = 13$

$4x - 3 + 3 = 13 + 3$ Add 3.

$4x = 16$ Simplify.

$\frac{4x}{4} = \frac{16}{4}$ Divide by 4.

$x = 4$ Simplify.

Check

$4x - 3 = 13$

$4(4) - 3 \stackrel{?}{=} 13$

$13 = 13$ ✓

b. $2(y - 8) = y + 6$

$2y - 16 = y + 6$ Distributive Property

$2y - y - 16 = y - y + 6$ Subtract y.

$y - 16 = 6$ Simplify.

$y - 16 + 16 = 6 + 16$ Add 16.

$y = 22$ Simplify.

Check

$2(y - 8) = y + 6$

$2(22 - 8) \stackrel{?}{=} 22 + 6$

$28 = 28$ ✓

Practice

Check your answers at BigIdeasMath.com.

Determine whether (a) $x = -1$ or (b) $x = 3$ is a solution of the equation.

1. $5x + 7 = 2$
2. $-4x + 8 = -4$
3. $2x - 1 = 3x - 4$

Solve the equation. Check your solution.

4. $x - 9 = 24$
5. $n + 14 = 0$
6. $-16 = 4y$
7. $-\frac{5}{6}t = -15$
8. $81 = 46 - x$
9. $4x + 5 = 1$
10. $x + 5 = 11x$
11. $9(y - 3) = 45$
12. $6 = 7k + 8 - k$
13. $6n + 3 = -4n + 7$
14. $2c + 5 = 3(c - 8)$
15. $18m + 3(2m + 8) = 0$
16. $\frac{w - 6}{5} = 8$
17. $\frac{15 + h}{3} = 10$
18. $\frac{8 - 3x}{5} = x$
19. $(8r + 6) + (4r - 1) = 14$
20. $\frac{2}{3}y - 3 = 9$
21. $\frac{1}{2}x - \frac{3}{10} = \frac{5}{2}x + \frac{7}{10}$

22. **MONEY** You have a total of \$3.25 in change made up of 25 pennies, 6 nickels, 2 dimes, and x quarters. How many quarters do you have?