

**Challenge: Skills and Applications**

For use with pages 145–151

In Exercises 1-10, solve the equation.

1.  $\frac{2}{3}x - \frac{3}{5} = \frac{4}{9}$

2.  $1 - \frac{8}{9}x = \frac{5}{6}$

3.  $8 - 2|r| = -12$

4.  $3|y| - 22 = 0$

5.  $\frac{|x| - 5}{4} = 6$

6.  $6 - \frac{2}{3}|n| = -8$

7.  $33 - \frac{1}{5}(3x + 1) = 34$

8.  $\frac{1}{2} - 3(x + 1) = 8$

9.  $6a - 4[2 - 3(4a - 3)] = -17$

10.  $5|g| - (4 - 3|g|) = 20$

11. Marianna Montaine has 15 grams of plant nutrient that she is testing in a laboratory. She needs to give each plant in the test 0.4 grams of nutrient, and she wants to have 3 grams left over for future use. Write an algebraic model for this situation, where  $x$  represents the number of plants Marianna can test. Solve the problem.
12. A hexagon has three sides of the same length, two sides which are each two-thirds that length, and a sixth side of length  $14\frac{1}{2}$  centimeters. The perimeter of the hexagon is 86 centimeters. Write an algebraic model for this situation, where  $x$  represents the length of the three equal sides. Solve the equation. Then find the length of each side.
13. A person has quarters, dimes, nickels, and pennies, with a total value of \$3.86. The number of nickels is twice the number of quarters. The number of quarters is two less than the number of dimes. There are 40 coins altogether. Write and solve an equation to find the number of each coin.