

# Study Guide

## Multiplying a Polynomial by a Monomial

The example below shows how the distributive property can be used to multiply a polynomial by a monomial.

$$\begin{aligned} \text{Example 1: } 6a(a^2 + 5) &= 6a(2a^2) + 6a(5) \\ &= 12a^3 + 30a \end{aligned}$$

Many equations contain polynomials that must be added, subtracted, or multiplied before the equation can be solved.

### Example 2:

$$\begin{aligned} \text{Solve } -5 - (10 - 3p) &= 12. \\ -5 - (10 - 3p) &= 12 \\ -5 - 10 + 3p &= 12 \\ -15 + 3p &= 12 \\ -15 + 15 + 3p &= 12 + 15 \\ 3p &= 27 \\ \frac{3p}{3} &= \frac{27}{3} \\ p &= 9 \end{aligned}$$

### Example 3:

$$\begin{aligned} \text{Solve } 4(n - 2) + 5n &= 6(3 - n) + 18. \\ 4(n - 2) + 5n &= 6(3 - n) + 18 \\ 4n - 8 + 5n &= 18 - 6n + 18 \\ 9n - 8 &= 36 - 6n \\ 9n + 6n - 8 + 8 &= 36 + 8 - 6n + 6n \\ 15n &= 44 \\ \frac{15n}{15} &= \frac{44}{15} \\ n &= 2\frac{14}{15} \end{aligned}$$

### Find each product.

1.  $5(2a + 3b)$

2.  $3x(4x - 2y)$

3.  $-4(a^2 - b^2)$

4.  $8b(b^2 - \frac{1}{2}b)$

5.  $-5t^2(\frac{1}{25}t^2 - \frac{1}{25}t + \frac{1}{5})$

6.  $(\frac{1}{2}x + y)(\frac{1}{2}y)$

### Simplify.

7.  $4r(2r^2 - 3r + 5) + 6r(4r^2 + 2r + 8)$

8.  $2b(b^2 + 4b + 8) - 3b(3b^2 + 9b - 18)$

### Solve each equation.

9.  $3(x + 5) - 6 = 18$

10.  $3x(x - 5) - 3x^2 = -30$

11.  $(4y - 3) - 8y + 6 = 19$

12. Ria's corn field has a perimeter of 18,000 meters. The length of one side is 3 meters less than twice the width. What are the dimensions of the field?

13. Three sides of a triangle have measures that are consecutive even integers. What are the lengths of the sides if the perimeter is 114 meters?