

Lesson 9-4

Example 1

Simplify.

a. $5x(x - 8)$

b. $-4z(6z^2 - 9z + 12)$

c. $-m^3(m^4 - 5m)$

Solution

$$\begin{aligned} \text{a. } 5x(x - 8) &= 5x(x) - 5x(8) \\ &= 5x^2 - 40x \end{aligned}$$

Use the Distributive Property.
Apply the product rule for exponents and the Commutative Property for Multiplication.

$$\begin{aligned} \text{b. } -4z(6z^2 - 9z + 12) &= -4z[6z^2 + (-9z) + 12] \\ &= -4z(6z^2) + [-4z(-9z)] + [-4z(12)] \\ &= -24z^3 + 36z^2 - 48z \end{aligned}$$

$$\begin{aligned} \text{c. } -m^3(m^4 - 5m) &= -m^3(m^4) + [-m^3(-5m)] \\ &= -m^7 + 5m^4 \end{aligned}$$

Example 2

TRAVEL Sean and Erica drove from their home to their grandmother's house. First, Sean drove for 2 hours at an average speed of 58 mi/h. Then Erica drove for 3 hours at an average speed that was s miles per hour slower than Sean's average speed.

- What formula would you use to find the distance that Erica drove?
- Write an expression for the distance driven by Erica. Then simplify the expression.

Solution

- Use the formula $d = r \cdot t$ where d = distance, r = rate, and t = time.

$$\begin{aligned} \text{b. } d &= (58 - s) \cdot 3 && \text{Replace } r \text{ with } 58 - s \text{ and } t \text{ with } 3. \\ d &= 3(58) + 3(-s) && \text{Use the Distributive Property.} \\ d &= 174 - 3s \end{aligned}$$

Erica drove $174 - 3s$ miles.