

Lesson 9-3

Example 1

Simplify.

a. $\frac{16ab}{10a}$

b. $\frac{-18g^5h^3}{20g^2h}$

Solution

a. $\frac{16ab}{10a} = \frac{2^4ab}{2 \cdot 5a}$ Write the prime factorization of each coefficient.
 $= \frac{8b}{5}$ To simplify, divide the numerator and denominator by any common factors.

b. $\frac{-18g^5h^3}{20g^2h} = \frac{(-1)(2)(3^2)g^5h^3}{(2^2)(5)g^2h}$ g^{5-2}, h^{3-1}
 $= \frac{(-1)(3^2)g^3h^2}{(2)(5)}$ Simplify.
 $= \frac{-9g^3h^2}{10}$

Example 2

Simplify.

a. $\frac{6c + 18}{3}$

b. $\frac{8x^5 - 10x^4 + 6x^2}{2x^2}$

c. $\frac{10m^2n + 15mn^2}{5mn}$

Solution

a. $\frac{6c + 18}{3} = \frac{6c}{3} + \frac{18}{3} = 2c + 6$

b. $\frac{8x^5 - 10x^4 + 6x^2}{2x^2} = \frac{8x^5}{2x^2} - \frac{10x^4}{2x^2} + \frac{6x^2}{2x^2} = 4x^3 - 5x^2 + 3$

c. $\frac{10m^2n + 15mn^2}{5mn} = \frac{10m^2n}{5mn} + \frac{15mn^2}{5mn} = 2m + 3n$

Example 3

The area of a rectangle is $(9x^4 + 6x^3 + 12x^2)$ ft². The width of the rectangle is $3x^2$ ft. Find the length of the rectangle.

Solution

Use the formula for the area of a rectangle. $A = \ell w$. So, $\ell = \frac{A}{w}$.

$$\begin{aligned}\ell &= \frac{A}{w} &&= \frac{9x^4 + 6x^3 + 12x^2}{3x^2} \\ &= \frac{9x^4}{3x^2} + \frac{6x^3}{3x^2} + \frac{12x^2}{3x^2} \\ &= 3x^2 + 2x + 4\end{aligned}$$

The length of the rectangle is $3x^2 + 2x + 4$ ft.