

Lesson 9-1

Example 1

Write each polynomial in standard form.

a. $3x + 6x^2 + 9x^3 + 12x^4$ b. $m + 8 + 9m^2$ c. $-6r - 15 + 12r^3 - 5r^2$

Solution

- a. Order the terms from the greatest power of x to the least power of x .

$$3x + 6x^2 + 9x^3 + 12x^4 = 12x^4 + 9x^3 + 6x^2 + 3x$$

- b. Order the terms from the greatest power of m to the least power of m . Write the constant last.

$$m + 8 + 9m^2 = 9m^2 + m + 8$$

- c. First write the polynomial as a sum of monomials, some of which have negative coefficients.

$$\begin{aligned} -6r - 15 + 12r^3 - 5r^2 &= (-6r) + (-15) + 12r^3 + (-5r^2) \\ &= 12r^3 + (-5r^2) + (-6r) + (-15) \text{ or } 12r^3 - 5r^2 - 6r - 15 \end{aligned}$$

Example 2

Simplify.

a. $16x^3 - 17 + 22x^3$ b. $5s^3 - 9s^2 - 4s^3 + 7s^2$ c. $-24r + 12r^2 + 11 - 6r$

Solution

a. $16x^3 - 17 + 22x^3 = 16x^3 + 22x^3 - 17$ Rearrange or collect like terms.
 $= (16 + 22)x^3 - 17$ Combine like terms using the Distributive Property.
 $= 38x^3 - 17$

b. $5s^3 - 9s^2 - 4s^3 + 7s^2 = 5s^3 + (-4s^3) + (-9s^2) + 7s^2$ Rearrange or collect like terms.
 $= [5 + (-4)]s^3 + (-9 + 7)s^2$ Combine like terms.
 $= 1s^3 + (-2s^2)$
 $= s^3 - 2s^2$

c. $-24r + 12r^2 + 11 - 6r = 12r^2 + (-24r) + (-6r) + 11$
 $= 12r^2 + [-24 + (-6)]r + 11$
 $= 12r^2 + (-30r) + 11$
 $= 12r^2 - 30r + 11$