

**4.2 PracticeA****In Exercises 1–3, find the sum.**

- $(-6x^2 + 3x - 7) + (10x^2 + 4x - 2)$
- $(10x^4 + 3x^2 - 5x + 4) + (7x^5 - 5x^4 + 2x - 9)$
- $(5x^4 + 3x^2 - 6x - 10) + (2x^3 - 7x^2 + 6x + 1)$

**In Exercises 4–6, find the difference.**

- $(4x^3 + 6x^2 - 9x + 1) - (8x^3 + 2x^2 - 5x - 1)$
- $(10x^4 - 4x^3 - 7x^2 + 5x + 9) - (2x^4 - 5x^3 - 4x^2 + 9x + 3)$
- $(7x^5 + 4x^3 - 2x^2 + 12x + 5) - (6x^4 - 9x^3 + x^2 - 3)$
- A city is planning a new sports park. The total area (in square feet) of the park is modeled by the expression  $9x^2 + 4x - 5$ . The area of the park designated for soccer fields is modeled by the expression  $2x^2 - 5x + 3$ . Write an expression that models the area of the park that is not designated for soccer fields.

**In Exercises 8–11, find the product.**

- $5x^2(3x^2 + 7x + 6)$
- $-2x^4(10x^3 - 9x^2 - 7x + 4)$
- $(8x^2 - 3x + 1)(-3x + 2)$
- $(-x - 6)(3x^2 + 2x + 9)$
- Describe and correct the error in performing the operation.

$$\times \quad -3x^2(4x^2 - 5x + 7) = -12x^4 - 15x^3 + 21x^2$$

**In Exercises 13–16, find the product of the binomials.**

- $(x - 1)(x + 4)(x - 3)$
- $(x - 6)(x - 9)(x + 2)$
- $(x + 3)(2x + 1)(2x - 3)$
- $(3x + 5)(x - 4)(4x + 1)$

**In Exercises 17–19, find the product.**

- $(x + 8)(x - 8)$
- $(y + 4)^2$
- $(2p - 3)^2$

## 4.3 Practice A

In Exercises 1–4, divide using polynomial long division.

1.  $(x^2 + x + 12) \div (x - 5)$
2.  $(2x^2 - x - 1) \div (x - 2)$
3.  $(x^3 + x^2 - 9x - 6) \div (x^2 - 9)$
4.  $(6x^3 - x^2 + 12x) \div (x^2 + 2)$

In Exercises 5–10, divide using synthetic division.

5.  $(x^2 + 6x + 1) \div (x - 3)$
6.  $(3x^2 - 11x - 4) \div (x - 1)$
7.  $(2x^2 - x + 5) \div (x + 2)$
8.  $(x^3 - 2x + 6) \div (x + 3)$
9.  $(x^2 + 25) \div (x - 5)$
10.  $(5x^2 - 3x + 2) \div (x - 1)$

11. Describe and correct the error in using synthetic division to divide  $x^3 + 2x^2 + 7$  by  $x + 3$ .

$$\begin{array}{r|rrrr} \times 3 & 1 & 2 & 0 & 7 \\ & & 3 & 15 & 45 \\ \hline & 1 & 5 & 15 & 52 \end{array}$$

$$\frac{x^3 + 2x^2 + 7}{x + 3} = x^2 + 5x + 15 + \frac{52}{x + 3}$$

In Exercises 12–15, use synthetic division to evaluate the function for the indicated value of  $x$ .

12.  $f(x) = -x^2 - 7x + 18$ ;  $x = -2$
13.  $f(x) = 2x^2 - 3x + 6$ ;  $x = 5$
14.  $f(x) = x^3 + 2x^2 - 3x + 4$ ;  $x = -1$
15.  $f(x) = x^3 + 2x^2 - 5x + 12$ ;  $x = -3$
16. You divide two polynomials and obtain the result  $x^2 - 3 + \frac{6}{x + 1}$ . What is the dividend? How did you find it?