

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?