

3.3 Practice B

In Exercises 1–3, divide using polynomial long division.

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

2. $(4x^4 + 2x^3 - 9x^2 - 36) \div (x^2 + x - 4)$

3. $(2x^4 - 40x^2 - 28) \div (x^2 - 5x - 2)$

In Exercises 4–9, divide using synthetic division.

4. $(4x^2 - 15x + 7) \div (x - 2)$

5. $(x^3 - 9x + 12) \div (x + 3)$

6. $(x^2 + 16) \div (x - 4)$

7. $(2x^3 - 5x^2 + 3) \div (x + 1)$

8. $(x^4 + 5x^3 - 6x^2 - 11x + 14) \div (x + 4)$

9. $(x^4 + 2x^3 + 4x - 20) \div (x + 6)$

10. 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 & 3 & -9 \\ \hline & & 1 & -1 & 3 & -2 \end{array} $ $ \frac{x^3 + 2x^2 + 7}{x + 3} = x^3 - x^2 + 3x - 2 $

In Exercises 11–14, use synthetic division to evaluate the function for the indicated value of x .

11. $f(x) = x^3 + x^2 - 4x + 3$; $x = -1$

12. $f(x) = -x^3 - 6x^2 + 6$; $x = -2$

13. $f(x) = x^4 + 5x^2 - 8x + 1$; $x = 4$

14. $f(x) = -x^4 - x^2 - 5$; $x = 3$

15. What is the value of k such that $(x^3 + kx^2 - 9x - 36) \div (x + 4)$ has a remainder of zero?