

Prerequisite Skills

1-9

(p. 82-83)

Use Long Division

1. Use long division to find each quotient.
Write the remainder.

- a) $3476 \div 28$
- b) $5973 \div 37$
- c) $2508 \div 17$
- d) $6815 \div 19$

Evaluate Functions

2. Given $P(x) = x^3 - 5x^2 + 7x - 9$, evaluate.

- a) $P(-1)$
- b) $P(3)$
- c) $P(-2)$
- d) $P\left(-\frac{1}{2}\right)$
- e) $P\left(\frac{2}{3}\right)$

Simplify Expressions

3. Expand and simplify.

- a) $(x^3 + 3x^2 - x + 1)(x - 2) + 5$
- b) $(2x^3 - 4x^2 + x - 3)(x + 4) - 7$
- c) $(x^3 + 4x^2 - x + 8)(3x - 1) + 6$
- d) $(x - \sqrt{2})(x + \sqrt{2})$
- e) $(x - 3\sqrt{5})(x + 3\sqrt{5})$
- f) $(x - 1 + \sqrt{3})(x - 1 - \sqrt{3})$

Factor Expressions

4. Factor each difference of squares.
Look for common factors first.

- a) $x^2 - 4$
- b) $25m^2 - 49$
- c) $16y^2 - 9$
- d) $12c^2 - 27$
- e) $2x^4 - 32$
- f) $3n^4 - 12$

5. Factor each trinomial.

- a) $x^2 + 5x + 6$
- b) $x^2 - 9x + 20$
- c) $b^2 + 5b - 14$
- d) $2x^2 - 7x - 15$
- e) $4x^2 - 12x + 9$
- f) $6a^2 - 7a + 2$
- g) $9m^2 - 24m + 16$
- h) $3m^2 - 10m + 3$

Solve Quadratic Equations

6. Solve by factoring.

- a) $x^2 - 2x - 15 = 0$
- b) $4x^2 + x - 3 = 0$
- c) $16x^2 - 36 = 0$
- d) $9x^2 = -15 + 48x$
- e) $20 - 12x = 8x^2$
- f) $21x^2 + 1 = 10x$

7. Use the quadratic formula to solve.
Round answers to one decimal place.

- a) $5x^2 + 6x - 1 = 0$
- b) $2x^2 - 7x + 4 = 0$
- c) $4x^2 = -2x + 3$
- d) $7x + 20 = 6x^2$

Determine Equations of Quadratic Functions

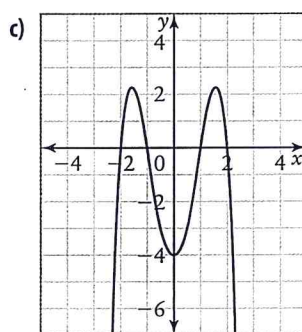
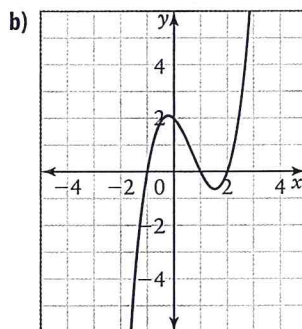
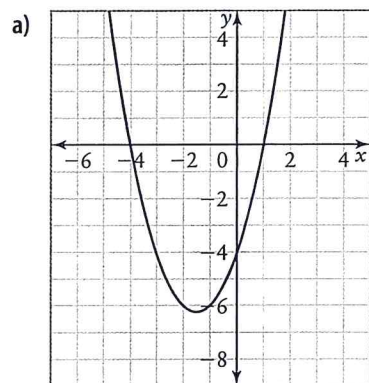
8. Determine an equation for the quadratic function, with the given zeros, and that passes through the given point.

- a) zeros: -4 and 1 ; point: $(-1, 2)$
- b) zeros: 0 and 3 ; point: $(2, 6)$
- c) zeros: -3 and 4 ; point: $(3, 24)$
- d) zeros: 5 and -1 ; point: $(4, -10)$
- e) zeros: $\frac{3}{2}$ and $-\frac{1}{2}$; point: $(0, 9)$

Determine Intervals From Graphs

9. For the graph of each polynomial function,

- identify the x -intercepts
- write the intervals for which the graph is above the x -axis and the intervals for which the graph is below the x -axis



PROBLEM

Best of U is a company that manufactures personal care products. Much of the company's recent success is due to the hard work of three key teams. The package design team is responsible for creating attractive, practical, and low-cost containers. The marketing team keeps in close touch with up-to-date trends and consumer demands for various products. Finally, the finance team analyses production costs, revenue, and profits to ensure that the company achieves its financial goals.

Throughout this chapter, you will discover how polynomial functions may be used to model and solve problems related to some of the aspects of running this company.

