Chapter 2 Review

Student Text Pages
114–115

Suggested Timing
75 min

Materials and Technology Tools
- grid paper
- algebra tiles
- computers with graphing software (optional)

Related Resources
- BLM G–1 Grid Paper
- BLM A–13 Self-Assessment Recording Sheet
- BLM 2–10 Chapter 2 Review

Accommodations

Motor– provide students with copies of **BLM G–1 Grid Paper** for graphing or encourage the use technology for graphing

Memory–let students use the flowcharts they created in Section 2.4 for factoring strategies

Ongoing Assessment

- Upon completing the Chapter 2 Review, students can also answer questions such as the following:
  - What questions did you find easy? Difficult? Why?
  - How often did you have to check the related worked example in the textbook to help you with the questions? For which questions?
- You may wish ask students to complete a copy of **BLM A–13 Self-Assessment Recording Sheet** to assist you in assessing your students.

Using the Chapter Review

- This Chapter Review is organized by sections and is designed to review different skills and concepts in this chapter.
- The students might work independently to complete the Review, then in pairs to compare solutions. If you plan to allow students to use the flowcharts they created in Section 2.4 for the Practice Test, they can also use the flowcharts for the Review. If not, encourage students to use the flowcharts initially but then try to work on some factoring questions without the flowcharts.
- Alternatively, the Review could be assigned for reinforcing skills and concepts in preparation for the Practice Test. Provide an opportunity for the students to discuss any questions containing strategies or questions with features that they find difficult.
- After students have completed this Chapter Review, encourage them to make a list of questions that caused them difficulty, and include the related sections and teaching examples. They can use this to focus their studying for a final test on the chapter's content.
- Use **BLM 2–10 Chapter 2 Review** for extra review.

Chapter 2 Problem Wrap-Up

Student Text Page
115

Suggested Timing
40 min

Materials and Technology Tools
- computer with Internet access and/or *The Geometer's Sketchpad®* (optional)

Related Resources
- BLM 2-11 Chapter 1 Problem Wrap-Up Rubric

Using the Chapter Problem

- You may need to have Internet access to work on this problem.
- This problem suggests a good half-period activity. Students could perform this task when they finish a test early or, perhaps on a short-end-period day. This problem could augment a chapter test in the form of a performance assessment.
- One strategy to consider is to have students import a picture into *The Geometer's Sketchpad®* and fit a parabolic curve to the structure, using the method outlined in the Technology Extension of this chapter.

Level 3 Notes

- Student gives three examples where a parabola is used in engineering or architecture.
- Student finds a quadratic function that models the structure in vertex form.
- Student expresses the function in standard form and factored form.
- Student uses the information from the three different forms to describe the features of the parabola.
- Student makes all calculations correctly.

Level 3 Sample Response

a) Many dome structures, arches of ancient buildings, satellite dishes that reflect waves, searchlights, and listening devices have cross-sections in the shape of a parabola.

b) An arc-shaped window on top of a door is 100 cm wide and 60 cm tall. If the origin is set at the left end of the base, then the highest point of the window will be at the vertex with coordinates (50, 60). Let the quadratic function be in the form $y = -a(x - h)^2 + k$. Since $h = 50$, $k = 60$, and the point (100, 0) is on the graph of the function, substitute these values into the equation $y = -a(x - h)^2 + k$ to get:

$$0 = -a(100 - 50)^2 + 60$$
$$0 = -250a + 60$$
$$250a = 60$$
$$a = \frac{60}{250}$$
$$a = 0.24$$

The arc-shaped window frame can be modelled by this quadratic function:
$y = -0.24(x - 50)^2 + 60$

c) Expand the function:
$y = -0.24(x - 50)^2 + 60$
$y = -0.24(x^2 - 100x + 250) + 60$
$y = -0.24x^2 + 24x - 60 + 60$
$y = -0.24x^2 + 24x$

The function in standard form is: $y = -0.24x^2 + 24x$

Factor this function:
$y = -0.24x^2 + 24x$
$y = -0.24x(x - 100)$

The function in factored form is: $y = -0.24x(x - 100)$

d) The shape opens downward since $a = -0.24$ is negative. The highest point (the vertex) is at (50, 60), a horizontal distance of 50 cm from and a vertical distance of 60 cm from the origin. The shape is symmetrical about the vertical line $x = 50$, and has x-intercepts 0 and 100, which are the zeros of the function.

e) The zeros of the functions are admissible solutions as they represent actual points on the left and right ends of the base of the window.

Accommodations

Gifted and Enrichment–have students model more than one structure with quadratic functions and express each function in three different forms

Motor–use technology such as *The Geometer's Sketchpad*® for fitting a parabolic curve to the parabolic structure

Summative Assessment

- Use **BLM 2–11 Chapter 2 Problem Wrap-Up Rubric** to assess student achievement.

What Distinguishes Level 2

- Student gives fewer than three examples where a parabola is used in engineering or architecture.
- Student finds a quadratic function that models the structure in vertex form.
- Student expresses the function in only one other form correctly.
- Student describes some of the features of the parabola.
- Student makes few errors in the calculations.

What Distinguishes Level 4

- Student gives more than three examples where a parabola is used in engineering or architecture.
- Student finds a quadratic function that models the structure with clear explanations.
- Student expresses the function in standard form and factored form.
- Student describes the features of the parabola with the use of a sketch of the graph.
- Student makes correct and well presented calculations.