Chapter 1 Practice Test

Student Text Pages
56–57

Suggested Timing
45–75 min

Materials and Technology Tools
- grid paper
- graphing calculator

Related Resources
- BLM G–1 Grid Paper
- BLM 1–15 Chapter 1 Practice Test
- BLM 1–16 Chapter 1 Test
- BLM 1–17 Chapter 1 Practice Test Achievement Check Rubric

Summative Assessment
- **BLM 1–15 Chapter 1 Practice Test** provides a source for possible diagnostic assessment.
- After students have completed **BLM 1–15 Chapter 1 Practice Test**, you may wish to use **BLM 1–16 Chapter 1 Test** as a summative assessment.

Accommodations

Motor–encourage the use of technology for graphing

Using the Practice Test

This practice test can be assigned as an in-class or take-home assignment. If it is used as an assessment, use the following guidelines to help you evaluate the students.
Can students do each of the following?
- describe properties of functions
- identify functions in different forms
- write the domain and range of a function
- demonstrate an awareness of real-life factors that can affect domain and range
- describe properties of quadratic functions
- identify quadratic functions using first and/or second differences
- use a graphing calculator to find equations which model quadratic functions
- graph transformations, including stretches and translations, on the graph of the quadratic function $y = x^2$

- **Question 16** is an Achievement Check question. Provide students with **BLM 1–17 Chapter 1 Practice Test Achievement Check Rubric** to help them understand what is expected.

Study Guide

Use the following study guide to direct students who have difficulty with specific questions to appropriate examples to review.

Question	Section(s)	Refer to
1	1.1	Example (pages 10–11)
2	1.2, 1.6	Example 1 (pages 18–19), Example (pages 49–50)
3	1.6	Example (pages 49–50)
4	1.4	Example 2 (page 36)
5	1.6	Example (pages 49–50)
6	1.1, 1.3	Example (pages 10–11), Example 2 (page 27)
7	1.2, 1.4	Example 1 (pages 18–19), Example 1 (page 34–35)
8	1.2	Example 2 (pages 19)
9	1.5	Example (pages 43–44)
10	1.6	Example (pages 49–50)
11	1.6	Example (pages 49–50)
12	1.6	Example (pages 49–50)
13	1.2, 1.5	Example 1 (pages 18–19), Example (pages 43–44)
14	1.1, 1.3, 1.6	Example (pages 10–11), Example 2 (page 27), Example (pages 49–50)
15	1.4, 1.6	Example 2 (page 36), Example (pages 49–50)
16	1.3, 1.6	Example 1 (page 26), Example (pages 49–50)

Achievement Check Sample Solution (page 57, question 16)

a)

Length (m)	Width (m)	Area (m²)
90	5	450
80	10	800
70	15	1050
60	20	1200
50	25	1250
40	30	1200
30	35	1050
20	40	800
10	45	450

b) Let x represent the length, in metres.
The width w will be:

$$w = \frac{200 - 2x}{4}$$
$$= 50 - 0.5x.$$

The area A will be: $A = x(50 - 0.5x)$
$= -0.5x^2 + 50x$

domain: $\{x \in \mathbf{R} \mid 0 < x < 100\}$;
range: $\{A \in \mathbf{R} \mid 0 < A \leq 1250\}$

c) The maximum area occurs when the length is 50 m and the width is 25 m.

d) The vertex is at (50, 1250).

e) Since $a = -0.5$, the equation is of the form $y = -0.5(x - h)^2 + k$. Use the points (40, 1200) and (60, 1200). Substitute into the equation to get
$1200 = -0.5(40 - h)^2 + k$ and $1200 = -0.5(60 - h)^2 + k$

Solve for h:

$$(40 - h)^2 = (60 - h)^2$$
$$1600 - 80h + h^2 = 3600 - 120h + h^2$$
$$1600 - 80h = 3600 - 120h$$
$$40h = 2000$$
$$h = 50$$

Solve for k:

$$1200 = -0.5(40 - 50)^2 + k$$
$$1200 = -50k$$
$$k = 1250$$

The equation is $y = -0.5(x - 50)^2 + 1250$.

f)

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QuadReg
 y=ax²+bx+c
 a=-.5
 b=50
 c=0
 R²=1
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The result from the graphing calculator verifies that the equation is $y = -0.5x^2 + 50\,x$, which is the same equation as $y = -0.5(x - 50)^2 + 1250$ in part e).