Chapter 13: Study Guide and Review

Vocabulary and Concept Check

- This alphabetical list of vocabulary terms in Chapter 13 includes a page reference where each term was introduced.
- Assessment: a vocabulary test/review for Chapter 13 is available on p. 706 of the Chapter 13 Resource Masters.

Lesson-by-Lesson Review

For each lesson:
- the main ideas are summarized,
- additional examples review concepts, and
- practice exercises are provided.

Vocabulary PuzzleMaker

The Vocabulary PuzzleMaker software improves students' mathematics vocabulary using four puzzle formats—crossword, scramble, word search using a word list, and word search using clues. Students can work on a computer screen or from a printed handout.

MindJogger Videoquizzes

MindJogger Videoquizzes provide an alternative review of concepts presented in this chapter. Students work in teams in a game show format to gain points for correct answers. The questions are presented in three rounds.
Round 1: Concepts (5 questions)
Round 2: Skills (4 questions)
Round 3: Problem Solving (4 questions)

Foldables Study Organizer

For more information about Foldables, see Teaching Mathematics with Foldables.

Have students look through the chapter to make sure they have included notes and examples in their Foldables for each lesson of Chapter 13. Encourage students to refer to their Foldables while completing the Study Guide and Review and to use them in preparing for the Chapter Test.

Chapter 13: Study Guide and Review

13-2 Volumes of Pyramids and Cones

Concept Summary
- The volume of a pyramid is given by the formula $V = \frac{1}{3} Bh$.
- The volume of a cone is given by the formula $V = \frac{1}{3} \pi r^2 h$.

Example:
Find the volume of the square pyramid.

$V = \frac{1}{3} Bh$

$= \frac{1}{3} (12 \times 9)$

$= 36 \times 9$

$= 324 \text{ cubic units}$

The volume of the pyramid is 324 cubic inches.

Exercises:
Find the volume of each pyramid or cone. Round to the nearest tenth.

14. $109.1 \text{ cm}^3$
15. $1464.4 \text{ ft}^3$
16. $368.3 \text{ m}^3$

13-3 Volumes of Spheres

Concept Summary
- The volume of a sphere is given by the formula $V = \frac{4}{3} \pi r^3$.

Example:
Find the volume of the sphere.

$V = \frac{4}{3} \pi r^3$

$r = 5$

$V = \frac{4}{3} \pi (5)^3$

$= \frac{4}{3} \pi (125)$

$= 523.6$

Use a calculator.

The volume of the sphere is about 523.6 cubic feet.

Exercises:
Find the volume of each sphere. Round to the nearest tenth.

17. The radius of the sphere is 2 feet. $33.5 \text{ ft}^3$
18. The diameter of the sphere is 4 feet. $33.5 \text{ ft}^3$
19. The circumference of the sphere is 15 millimeters. $4057.8 \text{ mm}^3$
20. The surface area of the sphere is 126 square centimeters. $133.8 \text{ cm}^3$
21. The area of a great circle of the sphere is 25π square units. $523.6 \text{ units}^3$


### 13-4 Congruent and Similar Solids

**Concept Summary**
- Similar solids have the same shape, but not necessarily the same size.
- Congruent solids are similar solids with a scale factor of 1.

**Example**
Determine whether the two cylinders are congruent, similar, or neither.
- Diameter of larger cylinder $= 6$ cm
- Diameter of smaller cylinder $= 3$ cm
- Height of larger cylinder $= 5$ cm
- Height of smaller cylinder $= 3$ cm

Substitution

**Similar**

**Exercises**
Determine whether the two solids are congruent, similar, or neither.
- See Example 1 on page 790.
- 22. $T = 332$ cm$^2$, $S = 116$ cm$^2$; congruent
- 23. $T = 116$ cm$^2$, $S = 332$ cm$^2$; similar

### 13-5 Coordinates in Space

**Concept Summary**
- The Distance Formula in Space is $d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2 + (z_2-z_1)^2}$.
- Given $(x_1, y_1, z_1)$ and $(x_2, y_2, z_2)$, the midpoint of $AB$ is at $(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}, \frac{z_1+z_2}{2})$.

**Example**
Consider $\triangle ABC$ with vertices A(1, 3, 10), B(3, 5, 10), and C(1, 7, 10). Find the length of the median from $A$ to $BC$ of $ABC$.

$M = \left(\frac{x_1+x_2+x_3}{2}, \frac{y_1+y_2+y_3}{2}, \frac{z_1+z_2+z_3}{2}\right)$

$AM = \sqrt{(16, 14, 9) - (1, 3, 10)}$

**Exercises**
Determine the distance between two points. Then determine the coordinates of the midpoint of the segment joining the pair of points.
- See Example 2 on page 778
- 24. $(4, 5, 3)$ and $(7, 8, 1)$
- 25. $(2, 3, -5, 4)$ and $(3, 3, -5, 4)$
- 26. $(x, 4, 5, 5)$ and the origin
- 27. $F(3V^2, 3V^2, 3V^2, 3V^2)$

### Appendix

**ExamView® Pro**
- Create multiple versions of tests.
- Create modified tests for inclusion students.
- Edit existing questions and add your own questions.
- Use built-in state curriculum correlations to create tests aligned with state standards.