# Chapter 9 Review

**Student Text Pages**
516 to 517

**Suggested Timing**
80 min

**Related Resources**
BLM 9.CR.1 Chapter 9 Review

## Ongoing Assessment

- Have students create a summary sheet of the skills in the chapter. Check this list holistically before assigning the Chapter Test.
- Upon completing the Chapter Review, have students answer questions such as the following:
  - *Did you work by yourself or with others?*
  - *What questions did you find easy? Difficult? Why?*
  - *How often did you have to check the related section in the text for Examples or Key Concepts? For which questions was this necessary?*

## Using the Chapter Review

Each question on **BLM 9.CR.1 Chapter 9 Review** reviews different skills and concepts. Have students work independently to complete the Chapter Review, then with a partner to compare solutions. Alternatively, assign the Chapter Review 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 they find difficult.

After they complete the Chapter Review, encourage students 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.

# Chapter 9 Practice Test

**Student Text Pages**
518 to 519

**Suggested Timing**
60 min

**Related Resources**
BLM 9.PT.1 Chapter 9 Practice Test
BLM 9.CT.1 Chapter 9 Test

## Summative Assessment

- After students complete **BLM 9.PT.1 Chapter 9 Practice Test**, you may wish to use **BLM 9.CT.1 Chapter 9 Test** as a summative assessment.

## Accommodations

**Gifted and Enrichment**—Challenge students to prepare an extra Chapter Test for their classmates.

**Motor**—Allow students to do fewer questions in this section.

**Memory**—Let students use a formula sheet when working through the questions in the Chapter Test.

**ESL**—Encourage students to use their translators when completing the questions in this section.

## 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 | 9.2 | Investigate B (page 486) |
| 2 | 9.3 | Example 1 (page 493) |
| 3 | 9.6 | Example (page 512) |
| 4 | 9.4 | Example 1 (page 500) |
| 5 | 9.2 | Investigate A (page 484) |
| 6 | 9.3, 9.6 | Example 1, Example (pages 493, 512) |
| 7 | 9.3 | Example 1 (page 493) |
| 8 | 9.6 | Example (page 512) |
| 9 | 9.3, 9.6 | Example 1, Example (pages 493, 512) |

## 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?

- Model the areas of rectangles with the same perimeter using geoboards, grid paper, *The Geometer's Sketchpad*®
- Model the perimeter of rectangles with the same area using geoboards, grid paper, toothpicks, *The Geometer's Sketchpad*®
- Conduct an investigation to determine the dimensions of the largest rectangles that can be enclosed (on four, three, or two sides) by a given perimeter by using appropriate techniques (manipulatives, spreadsheet, graphing calculator, or *The Geometer's Sketchpad*®)
- Conduct an investigation to determine the dimensions of the rectangle with a given area that can enclosed (on four, three, or two sides) by the least amount of fencing by using appropriate techniques (manipulatives, spreadsheet, graphing calculator, or *The Geometer's Sketchpad*®)
- Solve problems that involve maximizing the area of a rectangle for a given perimeter
- Solve problems that involve minimizing the fencing to enclose a fixed area (on four, three, and two sides)
- Model the surface area of square-based prisms with a fixed volume using interlocking cubes
- Conduct an investigation to determine the dimensions of the square-based prism of a given volume that has minimal surface area by using appropriate techniques (pencil and paper, spreadsheet)
- Conduct an investigation to determine the dimensions of the square-based prism with the largest volume for a given surface area by using appropriate techniques (pencil and paper, spreadsheet)
- Solve problems that involve maximizing the volume or minimizing the surface area of square-based prisms
- Conduct an investigation to determine the dimensions of the cylinder with the largest volume for a given surface area by using appropriate techniques (pencil and paper, spreadsheet)

- Conduct an investigation to determine the dimensions of the cylinder of a given volume that has minimal surface area by using appropriate techniques (pencil and paper, spreadsheet)
- Solve problems that involve maximizing the volume or minimizing the surface area of cylinders
- Minimize the amount of material in packaging problems that involve square-based prisms and/or cylinders

# Chapter 9 Problem Wrap-Up

**Student Text Pages**
519

**Suggested Timing**
30–60 min

**Related Resources**
BLM 9.CP.1 Chapter 9 Problem Wrap-Up Rubric

**Summative Assessment**

Use **BLM 9.CP.1 Chapter 9 Problem Wrap-Up Rubric** to assess student achievement.

## Using the Chapter Problem

The Chapter Problem is designed to incorporate the skills with both cylinders and prisms. Students design a cylindrical container to hold CDs, and then a square-based carton that will hold a number of these cylinders for shipping. This problem can be done individually or with a partner. It can also be used as an assessment piece, either completed in class or at home.

The size of the carton is left up to the student, but the customer needs at least 750 CDs. Students must design two different cartons. Finally, they are asked to recommend the number of CDs that could be packaged in the carton to minimize the packaging.

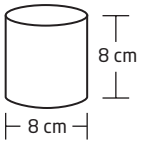
Students will find the design of the cylinder easier to handle if they have previously been assigned question 5 from Section 9.5. Designing the carton may be easier if students have completed question 12 from Section 9.3. (This question involved packing tissue boxes inside a carton using the least amount of material.)

## Teaching Suggestions

- The Chapter Problem will have a variety of solutions depending on the student's choice of carton in c).
- Some students may have difficulty providing diagrams in part d). Provide a brief review of perspective drawing or isometric views (top, side, front views).
- Provide concrete materials from which to build models of the situation (e.g., boxes, identical cans, thread spools, cardboard, scissors, tape, etc.).
- If the lead-up problems have been assigned throughout the chapter, review each of them, emphasizing the skills and formulas that were used. Conduct the review as a class or in small groups, perhaps using a jigsaw technique. (30–40 min)
- Provide sufficient time for students to think about this problem. This will lead to clearer, more complete solutions from students. If some students finish quickly, encourage them to consider other packaging options and to compare quantities of cardboard used.
- Due to the complexity of this problem, provide an opportunity to brainstorm approaches to the problem, with partners or in groups, before they begin. One strategy is to allow students to discuss the problem but not to write anything down until they begin individual work. Another strategy is to introduce the problem one day, but not assign it to be completed until another day.

**Level 3 Sample Response**

**a)** We learned that the minimum surface area cylinder is created when the height equals the diameter. Therefore, she should make a container 8 cm in diameter and 8 cm in height.

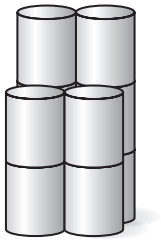



**b)** Each package will contain $\frac{8}{0.1} = 80$ CDs.

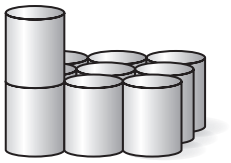
**c)** Talia will need 10 cylindrical packages to complete the order of 750 CDs, with the last package containing only 30 CDs.

**d)** Since the carton has a square base, there will be either 4, or 9, cylinders on the bottom layer. One option is a box with two layers of 4 cylinders and a third layer that has only 2 cylinders of CDs.

The dimensions of this cardboard carton are $2 \times 2 \times 3$ cylinders, which is $16 \text{ cm} \times 16 \text{ cm} \times 24 \text{ cm}$.



The other option has 9 cylinders on one layer and 1 on the second layer. This is the least practical option.



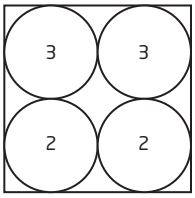
The dimensions of this cardboard carton are $3 \times 3 \times 2$ cylinders, which is $24 \text{ cm} \times 24 \text{ cm} \times 16 \text{ cm}$.

**e)** This order had some empty space in the carton. It would be better to order so that a cube box is used. That means 1, 8, 27, etc. packages of CDs. In CDs, this is 80, 640, 2160, etc.

### Level 3 Notes

Look for the following:

- A complete solution to most parts of the problem
- Minor computational errors
- Diagrams contain enough detail to demonstrate intended packaging
- Most steps in the solution have justification
- Carton size (correct) may be chosen without reference to other options




### What Distinguishes Level 2

At this level, look for the following:

- A few parts of the problem have complete solutions
- Major computational errors
- Diagrams are present but unclear or unrelated to the dimensions of the problem
- Little or no justification for the steps in the solution
- Carton size chosen may not have a square base

### What Distinguishes Level 4

At this level, look for the following:

- A complete solution to all parts of the problem
- No computational errors
- Diagrams clearly show how the packages will be placed in the carton, perhaps with multiple views
- Diagrams will be drawn to scale
- May include comments about the limits to the size of the carton due to weight restrictions of the shipping company
- A clear and concise justification is provided for all steps in the solution
- Choice of carton size will be fully justified with reference to alternate choices
- Solution may include extra space in packaging to allow materials to move in and out easily (thus complicating calculations)