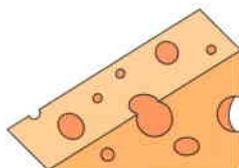


## Multiple Choice

For questions 1 to 4, select the correct answer.

1. A wedge of cheese most resembles a

- A square-based pyramid  
B rectangular prism  
C triangular prism  
D cone



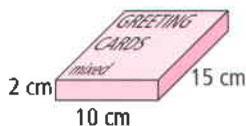
2. The side view of a cylinder, such as the hockey puck shown, is a

- A circle  
B square  
C triangle  
D rectangle



3. The surface area of the rectangular prism shown is

- A  $100 \text{ cm}^2$   
B  $200 \text{ cm}^2$   
C  $300 \text{ cm}^2$   
D  $400 \text{ cm}^2$

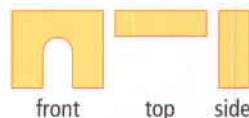


4. The volume of a classroom that measures 8 m by 10 m by 4 m is

- A  $84 \text{ m}^3$   
B  $196 \text{ m}^3$   
C  $320 \text{ m}^3$   
D  $384 \text{ m}^3$

## Short Answer

5. Draw a sketch of the three-dimensional figure that has the following front view, top view, and side view.

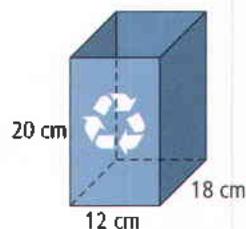


6. a) Sketch a polyhedron that has six faces. Name the polyhedron.  
b) Draw a net for this polyhedron.  
c) Sketch a different polyhedron that also has six faces.

7. What is the total surface area of the two fuzzy dice? They are identical in size. Each edge measures 9 cm.



8. Aaron plans to make a recycling bin out of cardboard. He wants it to have length 18 cm, width 12 cm, and height 20 cm. The bin does not need a lid.



- a) What area of cardboard does he need to make the recycling bin?  
b) How much space will the bin take up?

9. a) Draw a prism with two square bases and four rectangular faces.  
 b) Is it possible to have a prism that consists of two rectangular faces and four square faces? Use sketches or models to help you explain your answer.

### Extended Response

10. a) Sketch two different three-dimensional figures you can build using two of these triangular prisms.

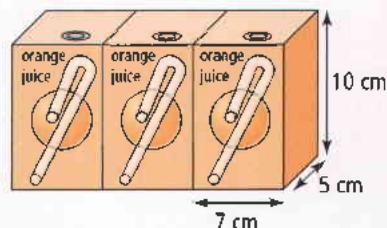


- b) Draw the front view, top view, and side view of each figure.  
 c) Draw a net for each figure.

11. Rhianne plans to build a sandbox. She has  $1.6 \text{ m}^3$  of sand. If she makes the box square, with each side  $2.0 \text{ m}$  long, how deep should she make the sandbox? Sketch a diagram of the sandbox and explain your result.
12. Suppose you want to wrap two objects, each with a volume of  $12 \text{ cm}^3$ . One object is a key chain in a box that is almost a cube. The other is a pen in a long thin box.
- a) Which box will need more wrapping paper? Explain your reasoning.  
 b) What strategy or strategies work well to help you answer this problem?

### Chapter Problem Wrap-Up

Single-serving orange juice boxes measure  $10 \text{ cm}$  by  $7 \text{ cm}$  by  $5 \text{ cm}$ . Packs of three boxes are shrink-wrapped for sale at grocery stores. The packs are shipped from the wholesaler in cartons containing 48 three-packs.



- Design a carton that can be used by the wholesaler. Use pictures, words, and numbers to describe your design to a possible buyer. Include all important measurements.
- Is your design the only possible one? If others are possible, show them.
- Which carton design do you think is best for shipping the juice boxes? Why?

## Chapter 8

1. **Answer:** C — triangular prism (a cheese wedge shape)
2. **Answer:** D — rectangle (side view of a cylinder)
3. **Answer:** D —  $400 \text{ cm}^2$  ( $2 \times 10 \times 2$ ) + ( $2 \times 15 \times 2$ ) + ( $10 \times 15 \times 2$ ) = 400
4. **Answer:** C —  $320 \text{ m}^3$
5. A good 3D figure match is a rectangular prism with a half-cylinder “tunnel” cut through it (so the front view looks like an arch, the top view shows the opening shape, and the side view is a rectangle).
6. **Ans:**
  - a. Options for a polyhedron with 6 faces: cube (or rectangular prism)
  - b. Net: 6 squares (cube net) *or* 6 rectangles (rectangular prism net)
  - c. Options for a different 6-faced polyhedron: if you chose cube in (a), then choose a rectangular prism here (or vice-versa).
7. Each die is a cube with an edge of 9 cm. Surface area (one cube) =  $6 \times 9^2 = 6 \times 81 = 486 \text{ cm}^2$  Two dice:  $2 \times 486 = 972 \text{ cm}^2$
8. Bin dimensions: 18 cm x 12 cm x 20 cm, no lid.
  - a. Cardboard area = bottom + 4 sides
    - i. Bottom:  $18 \times 12 = 216$
    - ii. Two long sides:  $2 (18 \times 20) = 2 \times 360 = 720$
    - iii. Two short sides:  $2 (12 \times 20) = 2 \times 240 = 480$   
Total SA =  $216 + 720 + 480 = 1416 \text{ cm}^2$
  - b. Space it takes up (volume) =  $18 \times 12 \times 20 = 4320 \text{ cm}^3$
9. **Ans:**
  - a. A prism with two square bases and four rectangular faces is a square prism.
  - b. No, not possible to have two rectangular faces and four square faces on a prism: If a rectangular prism has square faces, the dimensions force the “rectangle faces” to become squares too (it ends up being a cube), so you can’t get exactly 4 square faces and 2 rectangular faces.

## Chapter 8 Continued

### 10. Ans:

- a. a) Two different solids you can make with two identical triangular prisms:
  - i. Figure 1: Join them along the hypotenuse faces to make a rectangular prism (like putting two “triangle halves” together to make a box).
  - ii. Figure 2: Join them along a rectangular face to make a longer triangular prism.
- b. Views (describe/draw):
  - i. Figure 1 (rectangular prism): front/top/side are all rectangles.
  - ii. Figure 2 (longer triangular prism): front view is a triangle, top/side are rectangles.
- c. Nets (describe/draw):
  - i. Figure 1: net of a rectangular prism = 6 rectangles.
  - ii. Figure 2: net of a triangular prism = 2 triangles + 3 rectangles (but longer).

11. Volume =  $1.6 \text{ m}^3$  Base is square:  $2.0 \text{ m} \times 2.0 \text{ m} = 4.0 \text{ m}^2$  Depth =  $1.6/4.0 = 0.4 \text{ m} = 40 \text{ cm}$

### 12. Ans:

- a. a) The long thin pen box needs more wrapping paper, because for the same volume, a long thin shape has greater surface area than an almost-cube (cube-like shapes minimize surface area).
- b. Strategies:
  - i. Compare surface areas (use SA formulas)
  - ii. Sketch/build models with reasonable dimensions that multiply to  $12 \text{ cm}^3$
  - iii. Use the idea: more “stretched out” = more surface area