**PRACTICE Questions**

**Lesson 8.1**

1. Arianna is creating a rectangular outdoor space for her pet rabbit. Fencing material costs $15.25/m. She has $145. What dimensions give the greatest area, to the nearest tenth of a metre?

2. What is the minimum perimeter possible for a rectangle with an area of 500 cm²?

3. Sarah has 20 m of garden edging. What are the dimensions of the rectangular garden with the greatest area she can enclose with the edging?

4. Denzel wants to rope off a 800 m² rectangular swimming area using the beach as one of the sides. What should the dimensions of the rectangle be in order to use the minimum amount of rope?

**Lesson 8.2**

5. Calculate the area of the figure.

6. Michelle created an octagonal quilt piece for a quilt-making class project. It was cut from a square with a side length of 10.0 cm. To make the piece, Michelle cut off the four corners of the square, by measuring 2.9 cm from each corner, and then, cutting the diagonal. What are the area and perimeter of the octagonal quilt piece?

7. A school field has the dimensions shown.

   ![Field Dimensions](image)

   a) Calculate the length of one lap of the track.
   b) If Amanda ran 625 m, how many laps did she run?
   c) Calculate the area of the field.

8. Calculate the area and perimeter of each regular polygon.
   a) ![Hexagon](image)
   b) ![Pentagon](image)

**Lesson 8.3**

9. A baseball diamond is a square. The distance between the bases is 27.4 m. Calculate the direct distance from first base to third base.

10. Find the length of x accurate to the nearest tenth.

    ![Right Triangle](image)

11. Determine the length of the fence around the playground.

    ![Fence Dimensions](image)

12. A right triangle's legs are 20 cm and 48 cm. What is the area of the square whose side length is equal to the hypotenuse?

**Lesson 8.4**

13. Calculate the surface area of the regular pyramid.

    ![Pyramid](image)
14. Janice and Wilson have bought a new house. They decide to paint the exterior of the house, including the door, and re-shingle the roof. One 4-L can of paint covers 35 m$^2$. One bundle of shingles covers 2.25 m$^2$.

**a)** How many bundles of shingles do they need for the roof? (Hint: Find the slant height of the roof first.)

**b)** How many cans of paint do they need?

**c)** One can of paint is $29.95 and one bundle of shingles is $35.99. Find the total cost of the job.

15. Determine the surface area of a square-based pyramidal candle with a base side length of 8 cm and a slant height of 10 cm.

16. Determine the height of a square-based pyramid with a base side length of 8.0 cm and a surface area of 440.0 cm$^2$.

**Lesson 8.5**

17. Calculate the volume and surface area of each figure.

a) 

![Pyramid with dimensions](image)

b) 

![Pyramid with dimensions](image)

18. Gum is packaged in a square-based pyramid-shaped box with a distance of 6 cm from the centre of the base to the sides and a height of 12 cm.

**a)** How much material was used to create the box?

**b)** What is the volume of the box?

19. A solid figure is said to be truncated when a portion of the bottom is cut and removed. The cut line must be parallel to the base. Many paper cups, such as the one shown here, are truncated cones. Calculate the volume of this paper cup.

**Lesson 8.6**

20. Calculate the volume and surface area of this sphere.

21. A spherical bar of soap just fits inside its package, which is a cube with a side length of 8 cm.

**a)** What is the volume of the bar of soap?

**b)** Calculate the amount of empty space in the box.

22. A toy company makes rubber balls with a diameter of 20 cm. How much rubber would be saved per ball if the balls had a diameter of 15 cm?

**Lesson 8.7**

23. A square-based pyramid has a base side length of 13 cm and a height of 16 cm. What are the dimensions for a cylinder having the same volume as the pyramid?

**Lesson 8.8**

24. Determine, to one decimal place, the dimensions of the rectangular square-based prism that would have the greatest volume for each surface area. Show your solution.

**a)** 210 cm$^2$

**b)** 490 cm$^2$

25. What is the greatest volume for an open-topped rectangular prism with a surface area of 101.25 cm$^2$?