

Step-by-Step 1**Lesson 4.1, Question 12**

You will need square dot paper or triangular dot paper.

Step 1 Describe the object in part a.

What shapes are the faces? _____

How many faces of each shape are there?

Step 2 Use dot paper. Draw a net for the object. Mark sides of equal length with the same kind of hatch mark. Check that you have drawn the correct number of faces.

Visualize folding your net to make the object. Will sides of equal length meet to form a common edge? _____

Step 3 Visualize opening up the object in part a by cutting different edges.

Step 4 Repeat *Step 3* until you cannot draw any more different nets.

Step 5 Repeat *Steps 1 to 4* for the object in part b.

Step-by-Step 2**Lesson 4.2, Question 7**

You will need a copy of Master 4.17 and scissors.

Step 1 What faces must be present in the net of an octagonal prism?

Shape	Quantity

Step 2 Look at the diagram in Question 7.

Are the required faces and quantities present? _____

If not, which faces are missing? _____

Step 3 Cut out the diagram in Master 4.17.

Step 4 Fold the faces and try to construct the object.

Is this the net of an octagonal prism? _____

Step 5 If not, use scissors to cut and move faces to correct the problem. What did you do?

Step 6 Repeat *Step 5* as many times as you can. How many different nets can you make? _____

Step-by-Step 3**Lesson 4.3, Question 14**

Step 1 Sketch a right rectangular prism with dimensions 2 cm by 4 cm by 6 cm.

Step 2 Find the surface area of the prism in *Step 1*. _____

Step 3 Sketch a rectangular prism with dimensions 2 cm by 4 cm by 12 cm.

Step 4 Find the surface area of the prism in *Step 3*. _____

Step 5 Look at your answers to *Steps 2* and *4*.
What happens to the surface area of a rectangular prism when its length is doubled?

Step 6 Sketch a rectangular prism with dimensions 2 cm by 4 cm by 3 cm.

Step 7 Find the surface area of the prism in *Step 6*. _____

Step 8 Look at your answers to *Steps 2* and *7*.
What happens to the surface area of a rectangular prism when its length is halved?

Lesson 4.4, Question 12

Step 1 Sketch a right triangular prism with length 6 cm and bases right triangles with legs 3 cm and 4 cm and hypotenuse 5 cm.

Step 2 Find the surface area of the triangular prism in *Step 1*. _____

Step 3 Sketch a right triangular prism with length 12 cm and bases right triangles with legs 6 cm and 8 cm and hypotenuse 10 cm.

Step 4 Find the surface area of the triangular prism in *Step 3*. _____

Step 5 Look at your answers in *Step 2* and *Step 4*.

What happens to the surface area of a triangular prism when its dimensions are doubled?

Step 6 Is the student correct in saying that when you double all the dimensions of a triangular prism you will double the surface area? How do you know?

Lesson 4.5, Question 13

You will need 36 1-cm cubes.

- Step 1** Create a right rectangular prism using all 36 cubes.
Sketch the prism on a blank piece of paper and label each dimension.
- Step 2** Adjust your arrangement of cubes to create a second rectangular prism using all 36 cubes.
Sketch the second prism and label each dimension.
- Step 3** Repeat *Step 2* until you have created all the possible rectangular prisms using 36 cubes.

How do you know you have created all possible rectangular prisms?

- Step 4** Using your sketches, determine the surface area of each prism. Write each surface area below the sketch.

- Step 5** Write the dimensions of the rectangular prism with volume 36 cm^3 and the greatest surface area.

Length = _____ Width = _____ Height = _____

- Step 6** Write the dimensions of the rectangular prism with the least surface area.

Length = _____ Width = _____ Height = _____

Step-by-Step 6**Lesson 4.6, Question 9****Step 1** Complete the following:

The volume of a triangular prism is the _____ of the area of its base, A , and its length, l .

Step 2 Fill in the chart below:

Volume	Area of Base	Height
5 cm^3		
9 m^3		
8 m^3		
18 cm^3		

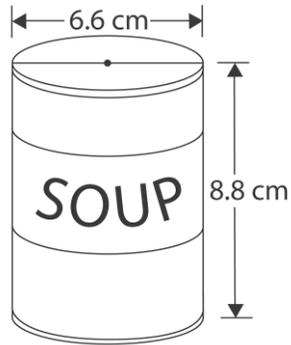
Step 3 Sketch each prism found above.**Step 4** For each volume, try to find a prism with a different length and base area that still has the required volume. How many can you find for each volume?

Volume	Number of different prisms
5 cm^3	
9 m^3	
8 m^3	
18 cm^3	

Step 5 What assumptions did you make?

Step-by-Step 7

Lesson 4.7, Question 12



The label is a rectangle. The height of the label is 8.8 cm.

The length of the label is equal to the circumference of the can plus 1 cm.

Step 1 Use $C = \pi d$ to calculate the circumference of the can. _____

Step 2 The label overlaps by 1 cm. Add 1 cm to your answer in *Step 1*. _____

Step 3 Multiply your answer in *Step 2* by the height, 8.8 cm, to calculate the area of the label. _____

Step 4 What is the area of the label? _____

Step-by-Step 8**Lesson 4.8, Question 11**

Step 1 The radius of the frozen juice can is 3.5 cm.

Use $A = \pi r^2$ to find the area of the base of the cylindrical can.

Area of the base = _____

Step 2 Multiply the area of the base by the height, 10 cm, to calculate the volume of the can.

Volume = _____

So, the capacity is: _____

Step 3 Switch the dimensions of the frozen juice can: _____

The new can has radius 12 cm.

Use $A = \pi r^2$ to find the area of the base of the new can.

Area of the base = _____

Step 4 Multiply the area of the base (*Step 3*) by the height, 3.5 cm, to calculate the volume of the new can.

Volume = _____

So, the capacity is: _____

Step 5 Compare the answers to *Steps 2* and *4*. What happens to the capacity of the can when the dimensions are switched?

Why do you think this happens?