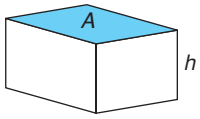
# Unit Review

## What Do I Need to Know?

### Right Rectangular Prism

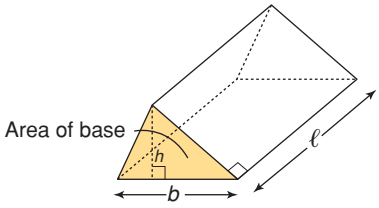
Surface area = 2 × area of Rectangle A
+ 2 × area of Rectangle B
+ 2 × area of Rectangle C


Volume = base area × height
$V = Ah$,
where $A$ represents the area of the base




### Right Triangular Prism

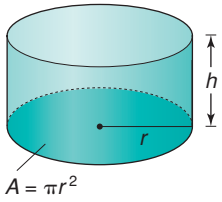
The length of the prism is $\ell$. Each triangular base has height $h$ and base $b$.
Surface area = sum of the areas of 3 rectangular faces + 2 × area of one triangular base
Volume = area of triangular base × length of prism
$V = A\ell$ where $A = \frac{1}{2}bh$

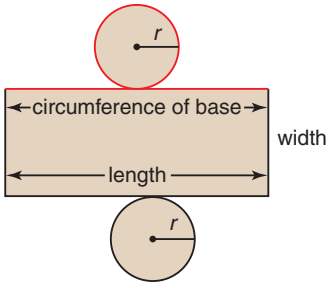


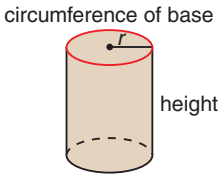

### Right Cylinder

The height of a cylinder is $h$ and its radius $r$.
Surface area = 2 × area of one circular base
+ area of a rectangle
Curved surface area = circumference of base
× height of cylinder

Volume = base area × height
$V = \pi r^2 h$



## What Should I Be Able to Do?

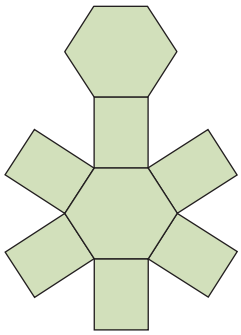
LESSON

4.1

**1.** Draw three different nets for the same right rectangular prism.
What must be true for a net to be that of a rectangular prism?

**2.** For each net, identify the object it folds to form.

a)



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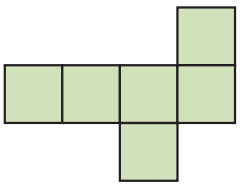

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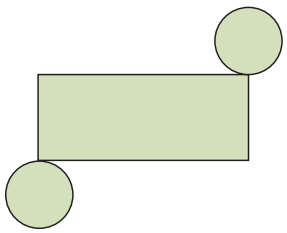

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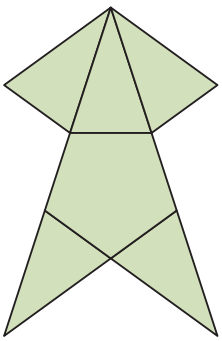
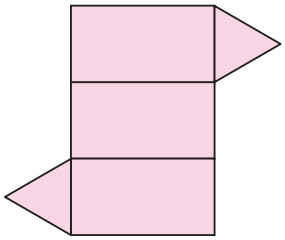


4.2

**3.** Predict which diagram is a net of a triangular prism. Your teacher will give you a large copy of each diagram. Cut out and fold them to confirm your prediction. How might the diagram that is not a net be fixed so it is a net?

a)



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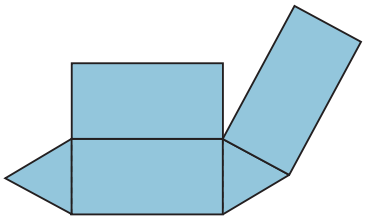
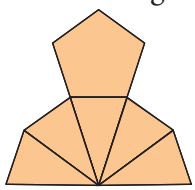


**4.** Which diagrams are nets?
For each net, identify the object.
For each diagram that is not a net, explain how to change it so it is a net.

a)



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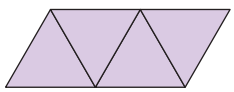

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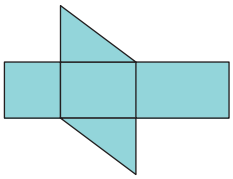


LESSON

4.3

**5.** A cube has edge length 4 cm.

**a)** What is its surface area?

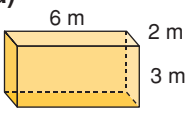
**b)** What shortcut could you use to find the surface area?

4.3

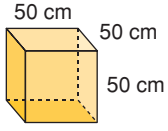
4.5

**6.** Find the surface area and volume of each rectangular prism.

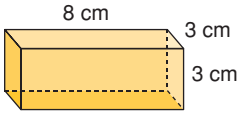
**a)**




**b)**




**c)**




**7.** Elizabeth wallpapers 3 walls of her bedroom. She paints the 4th wall. This is one of the smaller walls. The room has length 4 m, width 6 m, and height 3 m. A roll of wallpaper covers about 5 $m^2$. A 4-L can of paint covers about 40 $m^2$.

**a)** How much wallpaper and paint should Elizabeth buy?

**b)** What assumptions do you make?

**8.** **a)** Sketch all possible right rectangular prisms with volume 28 $m^3$.
Each edge length is a whole number of metres. Label each prism with its dimensions.

**b)** Calculate the surface area of each prism.

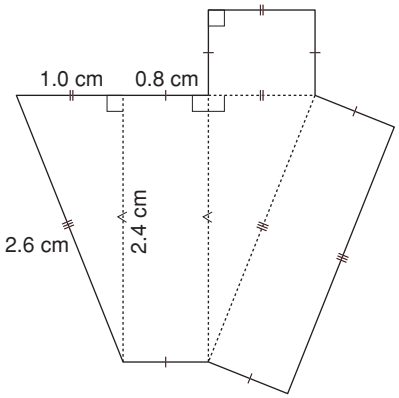
**9.** The base area, $A$, and height, $h$, of a right rectangular prism are given. Find the volume of each prism.

**a)** $A = 6$ $m^2$, $h = 4$ m

**b)** $A = 15$ $cm^2$, $h = 3$ cm

4.6

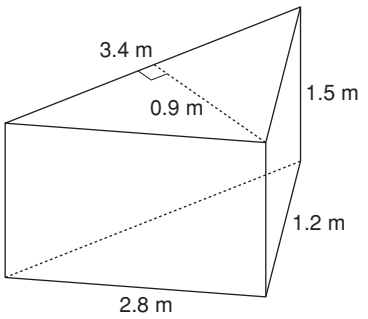
**10.** Here is a net of a triangular prism.




**a)** Calculate the surface area of the prism in square centimetres.

**b)** Calculate the volume of the prism in cubic centimetres.

**11.** **a)** Calculate the surface area of this prism. Sketch a net first, if it helps.

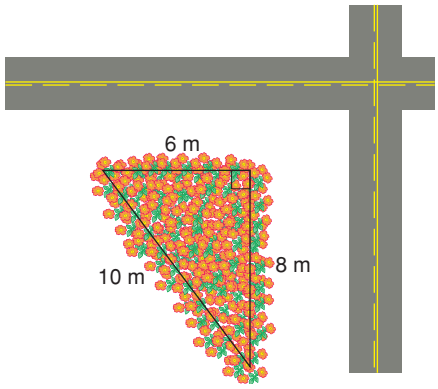



**b)** Calculate the volume of the prism.

**c)** Suppose you sit the prism on one of its rectangular faces. How does this affect the volume?

LESSON

**12.** The horticultural society is building a triangular flower bed at the intersection of two streets.
The edges of the bed are raised 0.25 m.
How much soil is needed to fill this flower bed?
Justify your answer.




**13.** Alijah volunteers with the horticultural society. He wants to increase the size but not the depth of the flower bed in question 12.

**a)** How can Alijah change the dimensions so that:
- the flower bed remains triangular, and
- the area of the ground covered by the bed doubles?

**b)** Sketch the new flower bed.
Label its dimensions.

**c)** How does the change in size affect the volume of soil needed?
Explain.

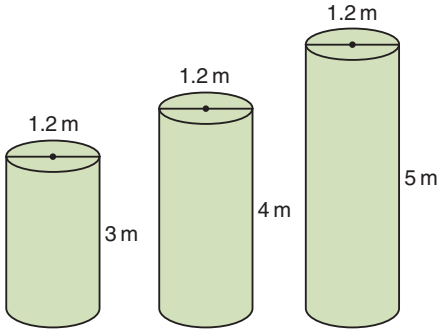
4.7
4.8

**14.** The label on a can of soup indicates a capacity of 398 mL. The height of the can is 10.5 cm. The diameter of the can is 7.2 cm.

**a)** Find the actual capacity of the can in millilitres.

**b)** Give a reason why the answer in part a is different from the capacity on the label.

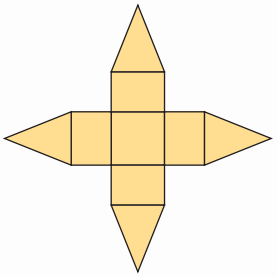
**15.** A sculpture comprises 3 cylindrical columns. Each column has diameter 1.2 m. The heights of the columns are 3 m, 4 m, and 5 m. The surfaces of the cylinders are to be painted.
Calculate the area to be painted.
(The base each column sits on will *not* be painted.)




**16.** A building is to be built in the shape of a cylinder. It will have height 155 m and diameter 25 m. The outside of the building will be made of zinc panels.
What area of zinc panels is needed to cover the vertical surface of the building?

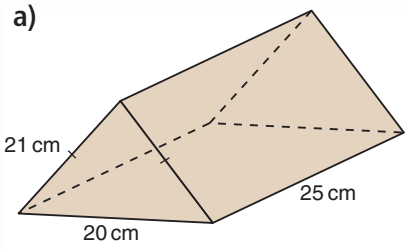
# Practice Test

**1.** **a)** Describe the object this net folds to form.
**b)** Fold a copy of the net to check your prediction.
**c)** Sketch the object.

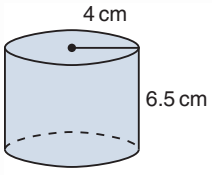


**2.** Draw a net for each object.
Identify and name each face.

**a)**

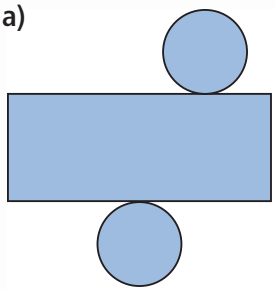



**b)**

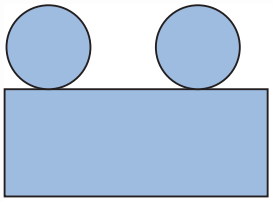



**3.** Which diagrams are nets of a cylinder? How do you know?

**a)**



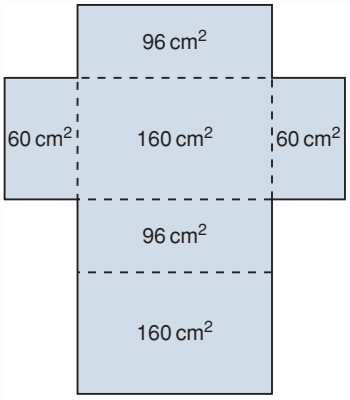
**b)**



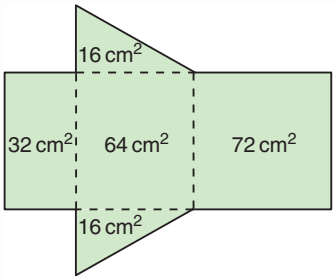
**c)**

**4.** Here are the nets of a rectangular prism, a triangular prism, and a cylinder.
What is the surface area of each object?

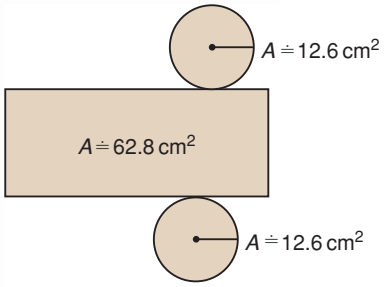
**a)**




**b)**

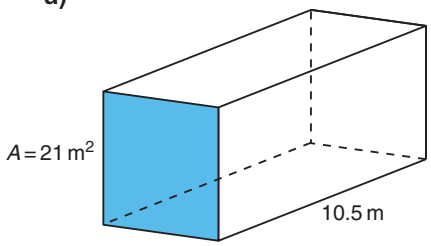



**c)**

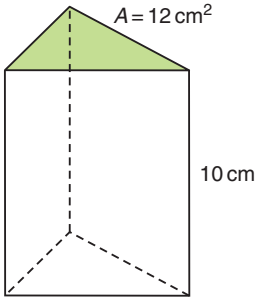


**5.** The base area and height of each prism are given.
Calculate the volume of each prism.

**a)**

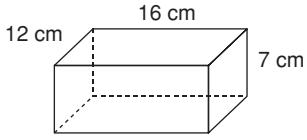



**b)**

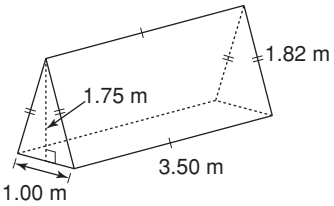



**6.** Find the surface area and volume of each prism.

**a)**

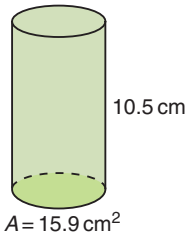



**b)**

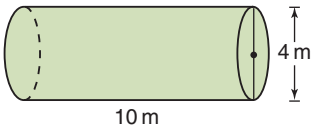



**7.** Find the volume of each cylinder.

**a)**




**b)**




**8.** Look at the triangular prism in question 6.
Suppose the base and height of the triangular faces are tripled.

**a)** How does this affect the volume of the prism? Explain.

**b)** Sketch the larger prism.

**c)** Calculate the volume of the larger prism.

**9.** The dimensions of a wooden sandbox for a local playground are 2 m by 3 m by 25 cm. The sandbox is a rectangular prism.

**a)** Calculate the area of wood needed to build the sandbox.

**b)** Calculate the volume of sand it will hold.

**10.** Which has the greater volume?

- a piece of paper rolled into a cylinder lengthwise, or
- the same piece of paper rolled into a cylinder widthwise

Justify your answer. Include diagrams in your answer.