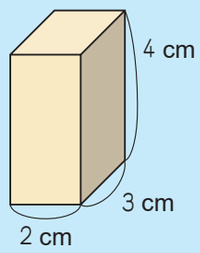
9 – 1 Volume of a Prism and Cylinder

Volume of a Prism

We learnt how to find the volume of the quadrangular prism as follow:

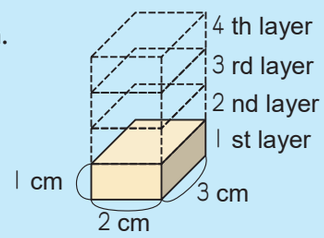
$3 \times 2 \times 4 = 24$ cm^3

Length, Width, Height, Volume



Find the volume of the quadrangular prism when the height is 1 cm.

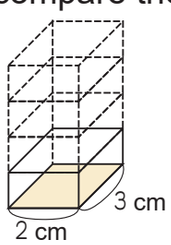
Math sentence $3 \times 2 \times 1 = 6$ Answer 6 cm^3



Instruction Area of the base

The bottom area is called the **area of the base**. Find it and compare the volume of the quadrangular prism with a height of 1 cm.

Math sentence $3 \times 2 = 6$ Answer 6 cm^2



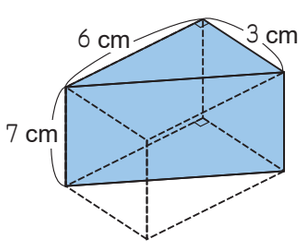
The volume may also be calculated by :
(The area of the base) × (Height)

Example 1 Find the volume of the triangular prism on the right.

Idea 1: It is half of a cuboid.

Math sentence $6 \times 3 \times 7 \div 2 = 63$ Answer 63 cm^3

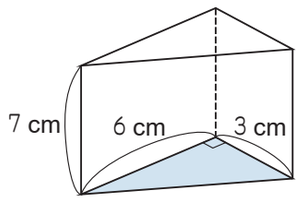
Volume of a cuboid



Idea 2: Use the area of the base.

Math sentence $6 \times 3 \div 2 \times 7 = 63$ Answer $63\ cm^3$

Area of the base

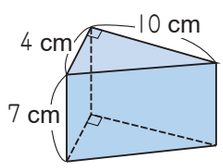


Both answers are the same.

The volume of the triangular prism can also be found using the formula
(Volume of Prism) = (Area of the base) × (Height)

1 Find the volume of the following prisms.

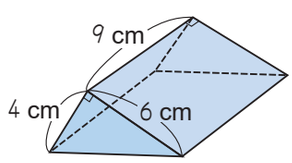
1



Math sentence

Answer _____

2

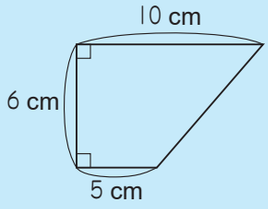


Math sentence

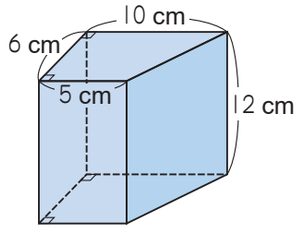
Answer _____

Where is the base?

Example 2 Find the volume of the prism below.



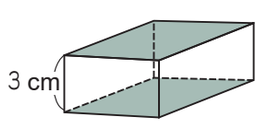
Find the area of the base.

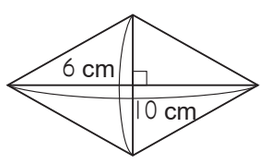


Math sentence $(5 + 10) \times 6 \div 2 \times 12 = 540$ Answer $540\ cm^3$

Area of the base

2 Find the volume of the prism below.





Math sentence

Answer _____

9 – 2 Volume of a Prism and Cylinder

Volume of a Cylinder

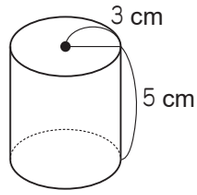
Instruction How to find the volume of a cylinder.

$(3 \times 3 \times 3.14) \times 5 = 141.3$

Volume

Area of the base

Height



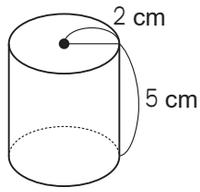
Find the volume like how you find the volume of a prism.

How do you find the area of the base?

(Volume of Cylinder) = (Radius) × (Radius) × 3.14 × (Height)

= (Area of the base) × (Height)

Example 1 Find the volume of the cylinder on the right.



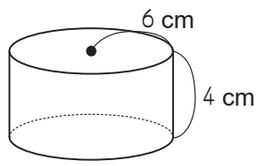
1 Fill in the ☐ with words.

(Volume of cylinder) = (Area of the base) × (Height)

2 Fill in the ☐ with numbers.

(2 × 2 × 3.14) × 5 = 62.8

1 Find the volume of the cylinder on the right.



1 Fill in the ☐ with words.

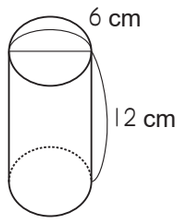
(Area of the base) = ☐ × ☐ × 3.14

2 Fill in the ☐ with numbers.

(☐ × ☐ × 3.14) × 4 = 452.16

Example 2 Find the volume of the following cylinders.

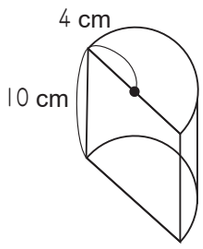
1 Since the diameter is 6 cm, the radius is 3 cm.



Math sentence $(3 \times 3 \times 3.14) \times 12 = 339.12$

Answer $339.12\ cm^3$

2 Since the figure is a half of the cylinder with 4 cm of radius and 10 cm of height.



Math sentence $(4 \times 4 \times 3.14 \div 2) \times 10 = 251.2$

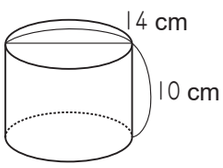
Alternatively, $(4 \times 4 \times 3.14) \times 10 \div 2 = 251.2$

Answer $251.2\ cm^3$

First, you find the area of the base. Or you can also find the volume by halving the volume of the cylinder with a 4 cm radius and a 10 cm height.

2 Find the volume of the following cylinders.

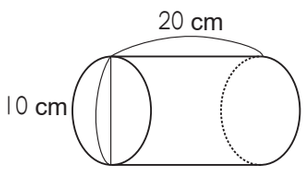
1



Math sentence

Answer _____

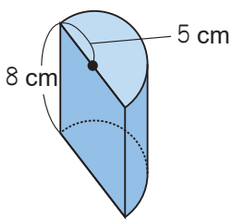
2



Math sentence

Answer _____

3



Math sentence

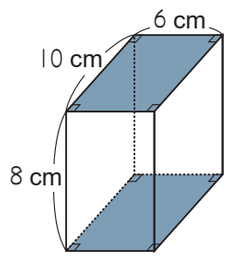
Answer _____

9 – 3 Volume of a Prism and Cylinder

Review

1 Find the volume of the following prisms and cylinders.

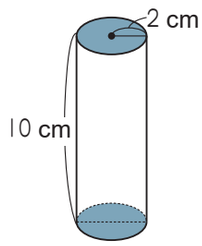
1



Math sentence

Answer _____

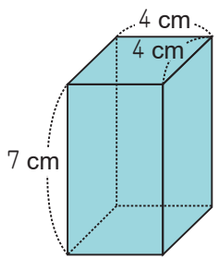
2



Math sentence

Answer _____

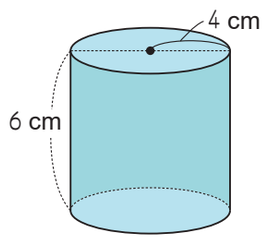
3



Math sentence

Answer _____

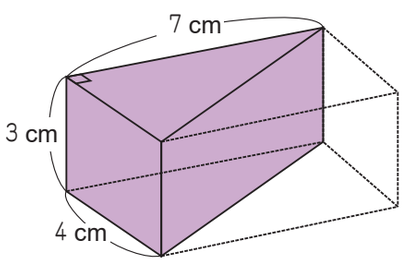
4



Math sentence

Answer _____

2 Fill in the blank with numbers to find the volume of the triangular prism on the right.



1 The triangle prism is half of a cuboid.
The volume is found by

(Length) × (Width) × (Height) ÷ 2,

Volume of a cuboid

□ × □ × □ ÷ □ = □ cm^3

2 Find the volume using the area of the base,
The volume is found by

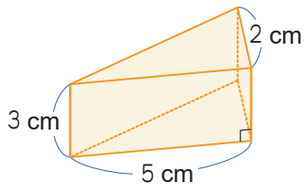
(Length) × (Width) ÷ 2 × (Height)

Area of a base

□ × □ ÷ □ × □ = □ cm^3

3 Find the volume of the following prisms.

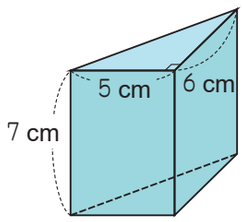
1



Math sentence

Answer _____

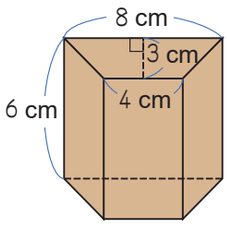
2



Math sentence

Answer _____

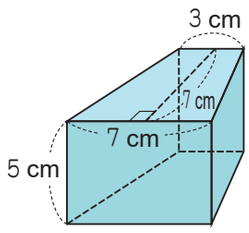
3



Math sentence

Answer _____

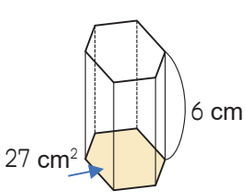
4



Math sentence

Answer _____

5



Math sentence

Answer _____