

SOLID GEOMETRY III

8.1b Volume of right prism

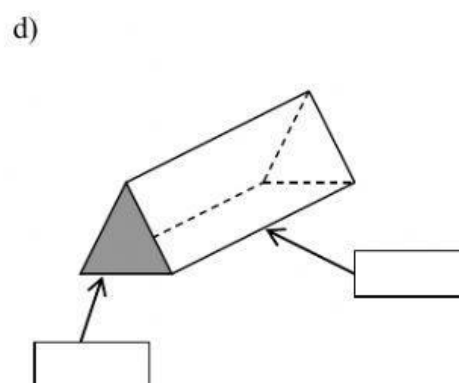
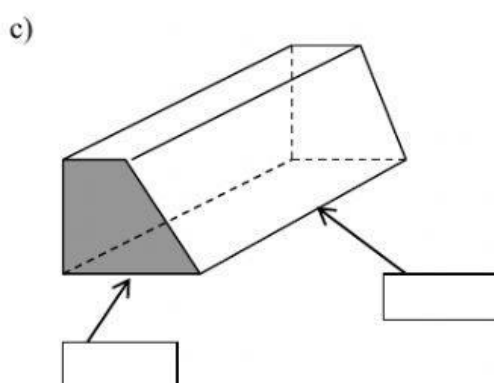
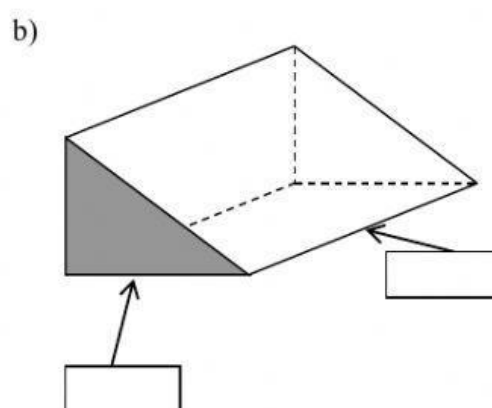
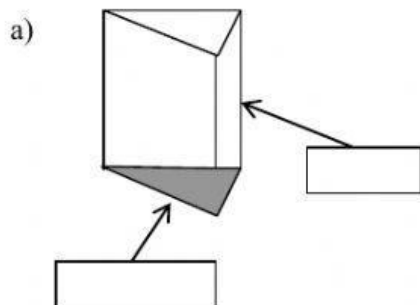
Learning Outcome :

To calculate the volume of right prism in cubic units given the height and

- a) the base area
- b) dimensions of the base

PRACTICE I

Identify the base and the height of the right prisms given below.



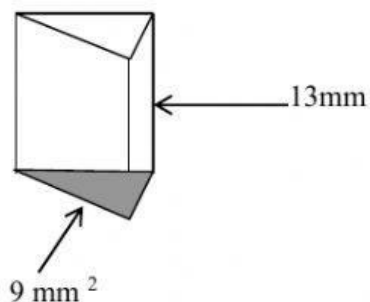
PRACTICE II

Volume of right prism = base area x height



Find the volume of each right prism.

1)

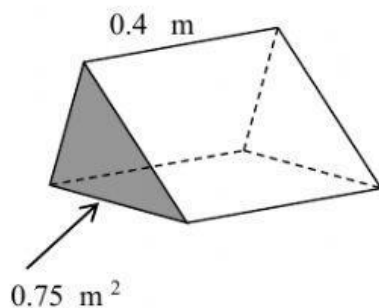


$$\text{Base area} = 9 \text{ mm}^2$$

$$\text{Height} = 13 \text{ mm}$$

$$\begin{aligned} \text{Volume} &= \text{base area} \times \text{height} \\ &= 9 \text{ mm}^2 \times 13 \text{ mm} \\ &= \underline{\hspace{2cm}} \text{ mm}^3 \end{aligned}$$

2)

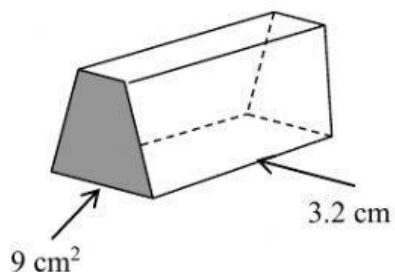


$$\text{Base area} = 0.75 \text{ m}^2$$

$$\text{Height} = 0.4 \text{ m}$$

$$\begin{aligned} \text{Volume} &= \text{base area} \times \text{height} \\ &= \underline{\hspace{2cm}} \times 0.4 \text{ m} \\ &= \underline{\hspace{2cm}} \text{ m}^3 \end{aligned}$$

3)



$$\text{Base area} = \underline{\hspace{2cm}}$$

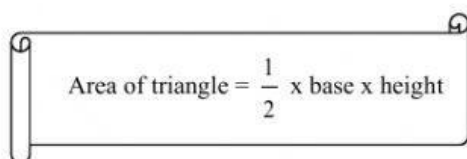
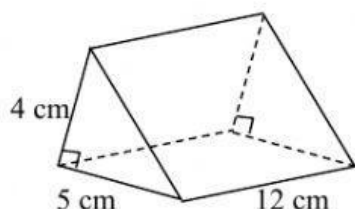
$$\text{Height} = \underline{\hspace{2cm}}$$

$$\begin{aligned} \text{Volume} &= \text{base area} \times \text{height} \\ &= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}} \\ &= \underline{\hspace{2cm}} \text{ cm}^3 \end{aligned}$$

PRACTICE III

Calculate the volume of the right prism given below.

1)



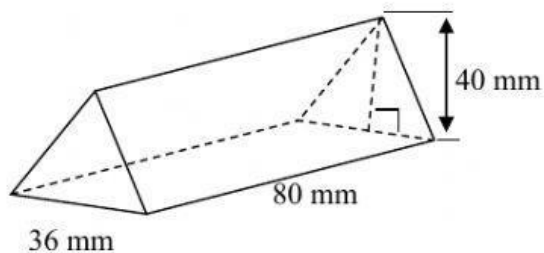
Shape of the base = a triangle

$$\text{Base area} = \frac{1}{2} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$$

$$\text{Height} = 12 \text{ cm}$$

$$\begin{aligned} \text{Volume} &= \text{base area} \times \text{height} \\ &= \underline{\hspace{1cm}} \times 12 \text{ cm} \\ &= \underline{\hspace{1cm}} \text{ cm}^3 \end{aligned}$$

2)



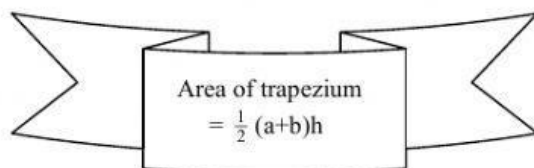
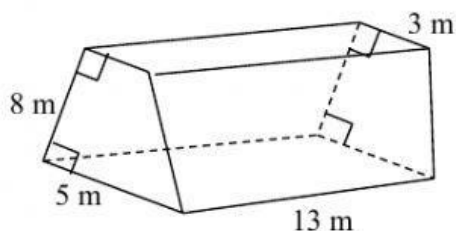
Shape of the base =

$$\begin{aligned} \text{Base area} &= \frac{1}{2} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \\ &= \underline{\hspace{1cm}} \end{aligned}$$

$$\text{Height} = \underline{\hspace{1cm}}$$

$$\begin{aligned} \text{Volume} &= \text{base area} \times \text{height} \\ &= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \\ &= \underline{\hspace{1cm}} \text{ mm}^3 \end{aligned}$$

3)



Shape of the base =

$$\begin{aligned} \text{Base area} &= \frac{1}{2} \times (\underline{\hspace{1cm}} + \underline{\hspace{1cm}}) \times \underline{\hspace{1cm}} \\ &= \underline{\hspace{1cm}} \end{aligned}$$

$$\text{Height} = \underline{\hspace{1cm}}$$

$$\begin{aligned} \text{Volume} &= \text{base area} \times \text{height} \\ &= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \\ &= \underline{\hspace{1cm}} \end{aligned}$$

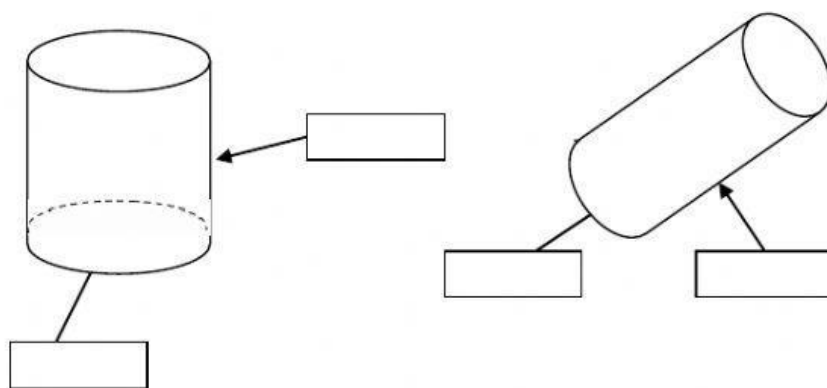
8.1d Volume of right circular cylinder.Learning Outcome;

To calculate the volume of right prism in cubic units given the height and

- a) the base area
- b) dimensions of the base

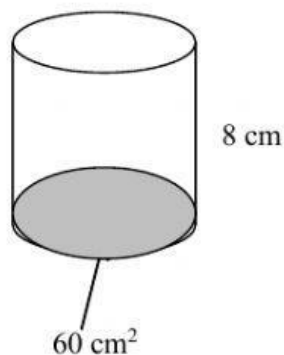
PRACTICE I

Identify the base, and the height of the right circular cylinders given below.

PRACTICE II

Calculate the volume of the following right circular cylinders

1.



Volume of right circular cylinder
= base area x height
= $(\pi r^2)h$

$$\text{Base area} = 60 \text{ cm}^2$$

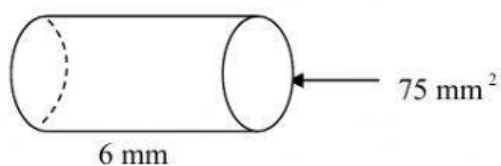
$$\text{Height} = 8 \text{ cm}$$

$$\text{Volume} = \text{base area} \times \text{height}$$

$$= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}} \text{ cm}^3$$

2)



$$\text{Base area} = \underline{\hspace{2cm}}$$

$$\text{Height} = \underline{\hspace{2cm}}$$

$$\text{Volume} = \text{base area} \times \text{height}$$

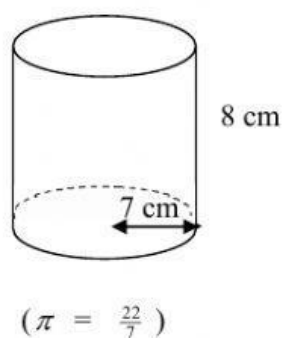
$$= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$$

$$= \underline{\hspace{1cm}} \text{ mm}^3$$

PRACTICE III

Calculate the volume of the following right circular cylinders.

1.



$$\text{Area of circular base} = \pi r^2$$

$$= \frac{22}{7} \times 7 \times 7$$

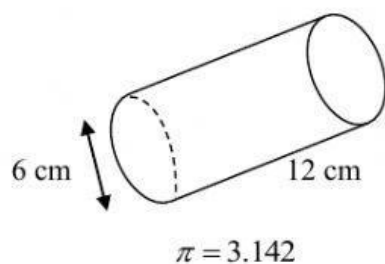
$$\text{Height} = 8 \text{ cm}$$

$$\text{Volume} = \text{base area} \times \text{height}$$

$$= \frac{22}{7} \times 7 \times 7 \times 8$$

$$= \underline{\hspace{1cm}} \text{ cm}^3$$

2.



Base diameter = 6cm, therefore radius = 3 cm

Area of circular base = πr^2

$$= 3.142 \times 3 \times 3$$

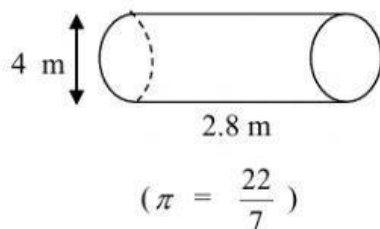
$$\text{Height} = 12 \text{ cm}$$

Volume = base area x height

$$= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$$

$$= \underline{\hspace{2cm}}$$

3.

Base diameter = 4 m, therefore radius = $\underline{\hspace{1cm}}$ mArea of circular base = πr^2

$$= \frac{22}{7} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$$

$$\text{Height} = 2.8 \text{ m}$$

Volume = base area x height

$$= \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$$

$$= \underline{\hspace{2cm}}$$

8.2d Volume of right circular cone.

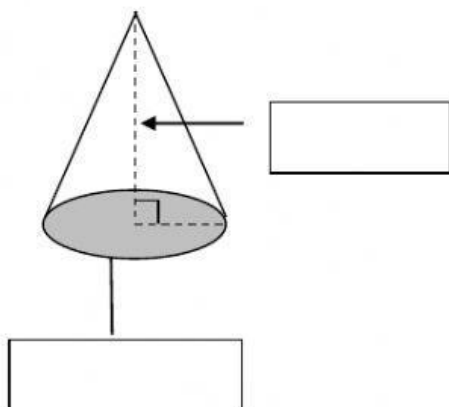
Learning Outcome:

To calculate the volume of a cone in mm^3 , cm^3 and m^3 , given the height and base radius.

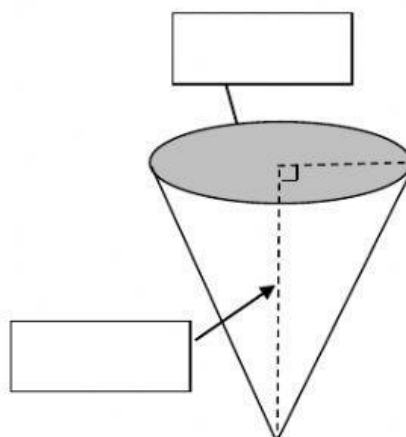
ACTIVITY I

Identify the base and the height of the right circular cones below.

1.



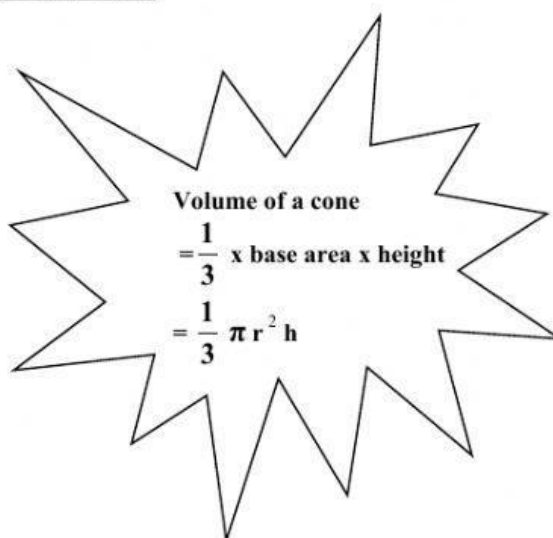
2.



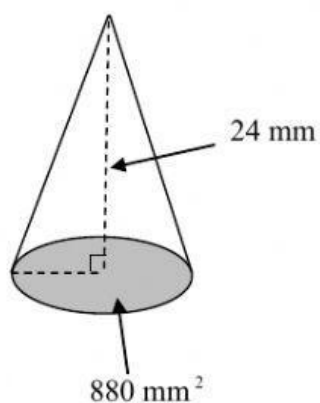
PRACTICE II

Find the volume of each right circular cone.

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1.

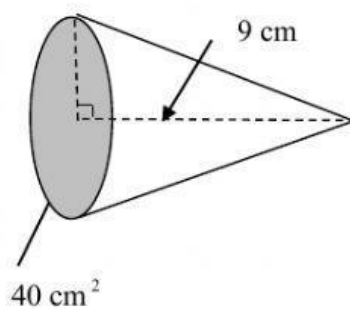


$$\text{Base area} = 880 \text{ mm}^2$$

$$\text{Height} = 24 \text{ mm}$$

$$\begin{aligned} \text{Volume of the cone} &= \frac{1}{3} \times \text{base area} \times \text{height} \\ &= \frac{1}{3} \times 880 \text{ mm}^2 \times 24 \text{ mm} \\ &= \underline{\hspace{2cm}} \text{ mm}^3 \end{aligned}$$

2.



$$\text{Base area} = 40 \text{ cm}^2$$

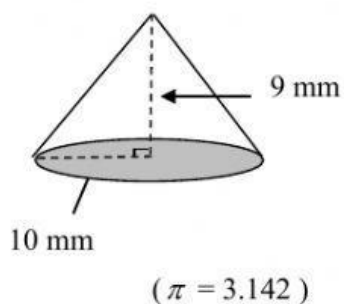
$$\text{Height} = \underline{\hspace{1cm}} \text{ cm}$$

$$\begin{aligned} \text{Volume of the cone} &= \frac{1}{3} \times \text{base area} \times \text{height} \\ &= \frac{1}{3} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \\ &= \underline{\hspace{2cm}} \end{aligned}$$

PRACTICE III

Find the volume of the following right circular cones.

1.



Base radius = 10 mm

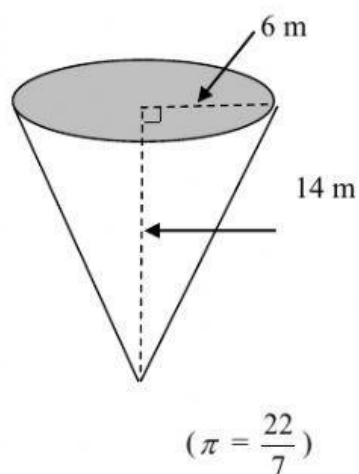
Height = 9 mm

$$\text{Volume of the cone} = \frac{1}{3} \pi r^2 h$$

$$= \frac{1}{3} \times 3.142 \times 10 \times 10 \times 9$$

$$= \underline{\hspace{2cm}} \text{ mm}^3$$

2.



Base radius = ____ m

Height = ____ m

$$\text{Volume of the cone} = \frac{1}{3} \pi r^2 h$$

$$= \frac{1}{3} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$$

$$= \underline{\hspace{2cm}}$$