
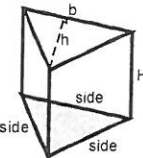
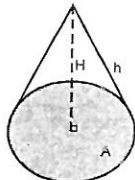
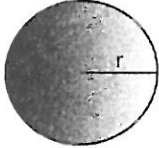
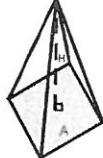
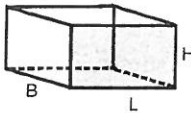
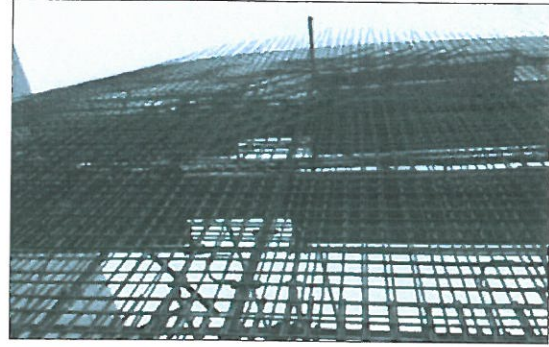
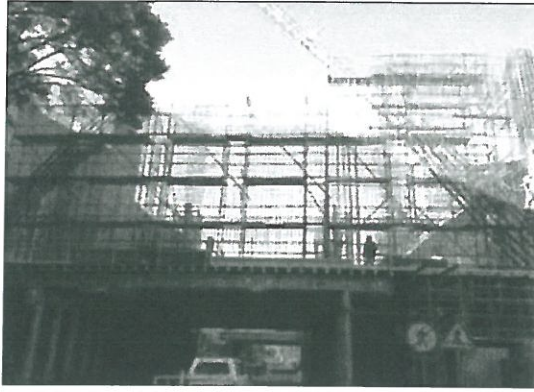


L9: Exercise 1: Volume

(a) Complete the table:

Date: _____

VOLUME 3D-FIGURES AND FORMULAS:		
	<p>Cylinder H=20cm r=10mm r = 1cm. π = 3,142</p>	<p>Volume = $\pi r^2 \times \perp H$ $3,142 \times 1^2 \times 20$ = 62,84 cm³</p>
	<p>Prism Area of base=21cm² H=14cm</p>	<p>Volume = area of base × H $(\frac{1}{2} \times b \times \perp h) \times H$ $21 \text{ cm}^2 \times 14 \text{ cm}$ = 294 cm³</p>
	<p>Cone Area of the base=12cm² H=14cm This is a third of a cylinder</p>	<p>Volume = $\frac{1}{3} \times \text{area of base} \times \perp H$ $= \frac{1}{3} \times (\pi r^2) \times H$ $= \frac{1}{3} (12)(14)$ = 56 cm³</p>
	<p>Sphere r= 10cm π = 3,142</p>	<p>Volume = $\frac{4}{3} \times \pi \times r^3$ $\frac{4}{3} \times 3,142 \times 10^3$ = 4189,3 ≈ 4189,33 cm³</p>
	<p>Pyramid Base= 9cm² Height=9cm</p>	<p>Volume = $\frac{1}{3} \times \text{area of base} \times \perp H$ $\frac{1}{3} \times 81$ = 27 cm³</p>
	<p>Cuboid Length=50cm Breadth=20cm Height=30cm</p>	<p>Volume = area of base × $\perp H$ = b × b × H $= 50 \times 20 \times 30$ = 30 000 cm³</p>



(The time difference between the top and bottom photos is 3 months)

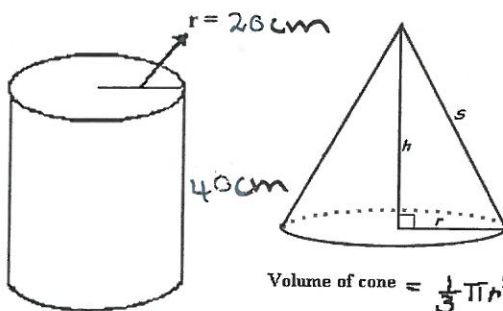


(b) The photos above show a 25m span bridge at the new Rosebank Mall shopping centre. It must be strong enough to carry three storeys. The walls are 250mm thick and 12m high. Calculate the amount of concrete that the contractor must order to build this wall.

$$l \times b \times h = 25 \text{ m} \times 0,25 \text{ m} \times 12 \text{ m}$$

$$= 75 \text{ m}^3$$

(c) A cylinder has to be filled with oil. The cylinder has a radius of 20 cm and a height of 40 cm. How many litres of oil will be needed to fill the cylinder if 1 litre = 0,001 m³. The volume of the cone is a third of the volume of a cylinder. How many litres of oil will be needed to fill up the cone?



$$\text{Volume of cone} = \frac{1}{3} \pi r^2 h \approx 16,76 \text{ l}$$

$$\pi r^2 h = 3,142 \times 20^2 \times 40 \text{ cm}^3$$

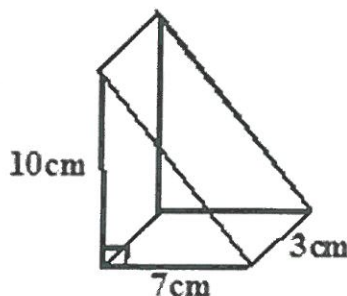
$$= 50272 \text{ cm}^3$$

$$= 50272 \text{ ml} = 50 \text{ ml}$$

$$\text{Cone: } \frac{1}{3} \times 50 \text{ l}$$

$$= 16,757,3 \text{ ml}$$

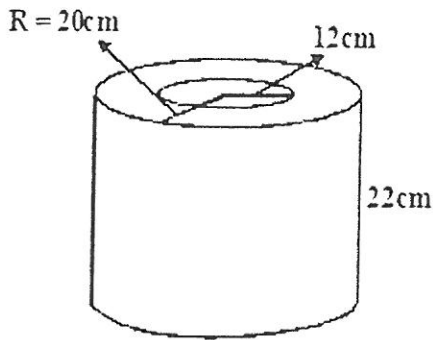
(d) Woolworths package their sandwiches in containers as shown in the figure.



Calculate the volume of this container.

$$\text{Volume: } \frac{l \times b \times h}{2} = \frac{1}{2} (10 \times 7 \times 3)$$

$$\frac{210}{2} \text{ cm}^3 = 105 \text{ cm}^3$$

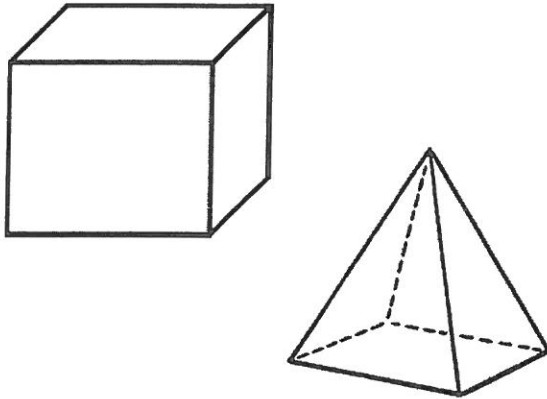


(e) This is a pipe. Calculate the volume of the steel needed to produce this pipe.

Calculate the volume of the outer cylinder. What is the volume of the inner cylinder?

Calculate the difference.

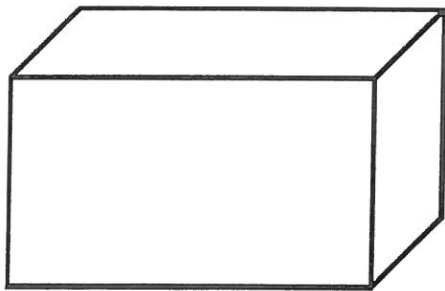
$$\underline{17695,74 \text{ cm}^3}$$



(f) Study the formulas in the table. The pyramid is a third of the cube, if the squares are the same. If the lengths of the sides of the cube is 5cm, calculate the volume of the cube and the pyramid (the same base area for the square)

$$\underline{\text{Volume of cube} = 5^3 = 125 \text{ cm}^3}$$

$$\underline{\text{Pyramid: } 14,17 \text{ cm}^3}$$



(g) This is a tank for fish.

The measurements of the sides are as follows:

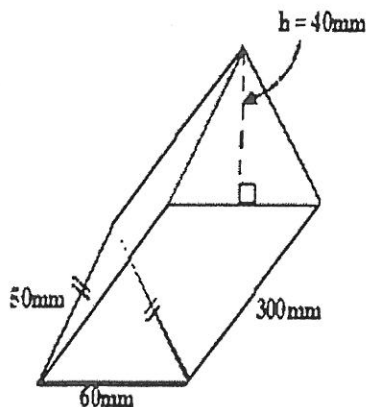
Length: 1,7m

Height: 500mm

Breadth: 700 mm

Convert the side lengths to the same unit. Determine the volume in cm^3 . Do the conversion into *ml*.

How many litre is it?



(h) A farmer wants to feed his chickens from the container. Determine the volume of the container.

$$\underline{\text{Volume of base} \times H}$$

$$= \frac{1}{2} \times b \times \perp h \times H$$

$$= \frac{1}{2} \times 60 \times 40 \times 300$$

$$= \underline{360000 \text{ mm}^3}$$

$$= 360 \text{ cm}^3 = 360 \text{ ml}$$

Exercise 1:

Date: _____

$$\begin{aligned} e) \pi r^2 h &= 3,142 \times (20 \text{ cm})^2 \times 22 \text{ cm} \\ &= 3,142 \times 400 \text{ cm}^2 \times 22 \text{ cm} \\ &= 27649,60 \text{ cm}^3 \end{aligned}$$

Inner Cylinder: $\pi r^2 h$

$$\begin{aligned} &= 3,142 \times 12^2 \times 22 \\ &= 3,142 \times 144 \times 22 \\ &= 9953,856 \text{ cm}^3 \end{aligned}$$

$$= 27649,6 - 9953,856 = 17695,744 \text{ cm}^3$$

g) Volume = $l \times b \times h$

$$\begin{aligned} &= 170 \text{ cm} \times 70 \text{ cm} \times 50 \text{ cm} \\ &= 595000 \text{ cm}^3 \end{aligned}$$

Since $1 \text{ cm}^3 = 1 \text{ ml}$

$\therefore 595000 \text{ ml}$

$= 595 \text{ l.}$