Starter

1) Round 25.89 to 3 significant figures

25.9

2) Solve the equation: 4 + T = 8

$-4 \quad -4$

$T = 4$

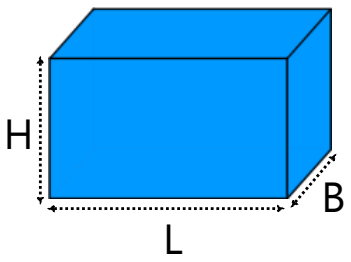
$T = 4$

3) Find a fifth of 67.8 (non-calc)

$$\begin{array}{r} 13.56 \\ 5\overline{)67.^{2}8^{3}0} \end{array}$$

4) Evaluate $\frac{2}{3} \times \frac{1}{5}$ $= \frac{2}{15}$

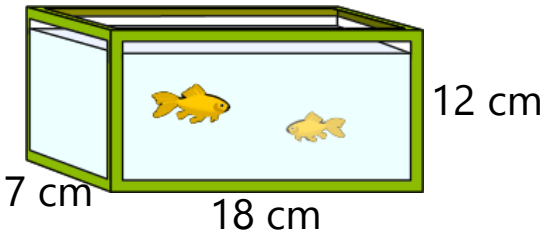
Volume of a Cuboid



V = L x B x H

Note: 1cm³ = 1ml

e.g. how much water does can this fish tank hold?



$V = L \times B \times H$

$= 18 \times 7 \times 12$

$= 1512 \text{ cm}^3$

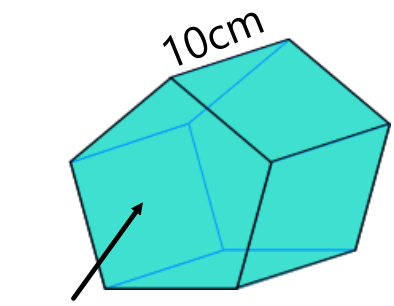
$= 1512 \text{ ml}$

$= 1.512 \text{ litres}$

Volume of Prisms

A prism has the same cross-section all the way through its height.

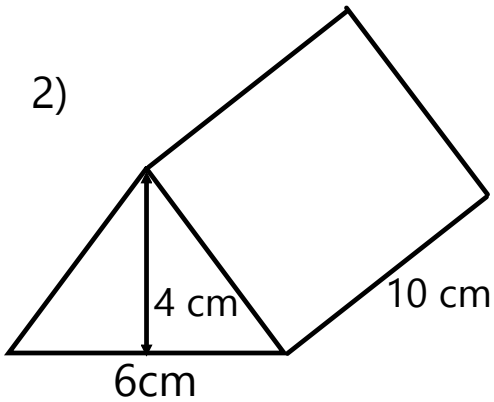
$\boxed{\text{Volume = cross section area x height}}$



Area = 18cm²

$V = A \times h$
$= 18 \times 10$
$= 180\ cm^3$

2)



Triangle:

$A = \frac{1}{2} \times b \times h$
$= \frac{1}{2} \times 6 \times 4$
$= 3 \times 4$
$= 12\ cm^2$

$V = A \times h$
$= 12 \times 10$
$= 120\ cm^3$

~~QAC~~

Starter

1) Round 65 789 220 to 3 significant figures

65800 000

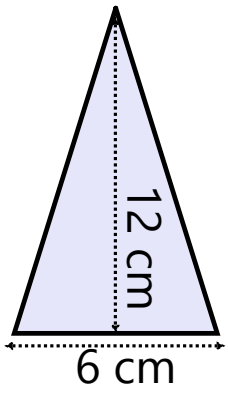
2) Find a tenth of 0.05

0.005

3) Find the volume of a cube of length 4cm

$V = L \times B \times H$
$= 4 \times 4 \times 4$
$= 64 cm^3$

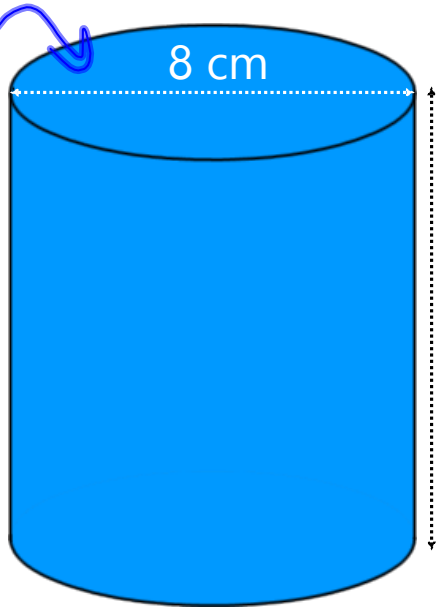
4) Findt the area of this triangle:



$A = \frac{1}{2} \times b \times h$
$= \frac{1}{2} \times 6 \times 12$
$= 3 \times 12$
$= 36 cm^2$

How would we find the volume of this object?

$A = \pi r^2$



h

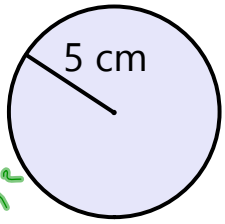
$V = \pi r^2 h$

Starter

1) Find the area of the following circles:

$A = \pi r^2$

a)



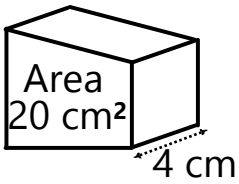
$A = \pi r^2$
$= \pi \times 5^2$
$= 78.5 cm^2$

b)

$A = \pi \times r^2$
$= \pi \times 3^2$
$= 28.3 cm^2$

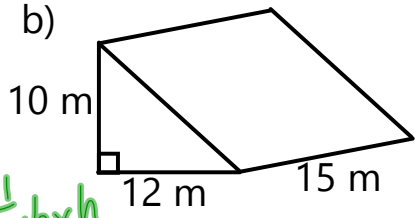
2) Find the volume of the prisms:

a)



$V = A \times h$
$= 20 \times 4$
$= 80 cm^3$

b)

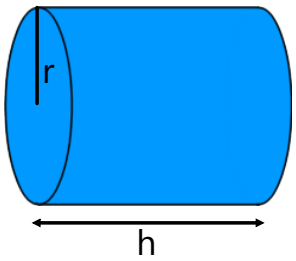


$A = \frac{1}{2} \times b \times h$
$= \frac{1}{2} \times 12 \times 10$
$= 60 m^2$

$A = A \times h$
$= 60 \times 15$
$= 900 m^3$

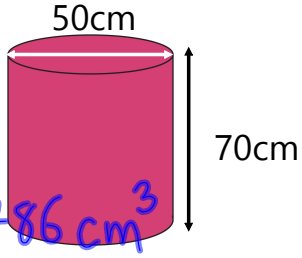
Volume of a Cylinder

$V = \pi r^2 h$



Example:

Find the volume to the nearest litre.



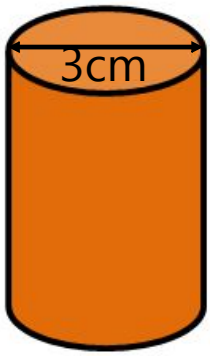
$V = \pi r^2 h$
$= \pi \times 25^2 \times 70$
$= 137444.6786 cm^3$
$= 137444.6786 ml$
$= 137.44$ litres
137 litres

Find the volume of these cylinders to 3 sig. fig.

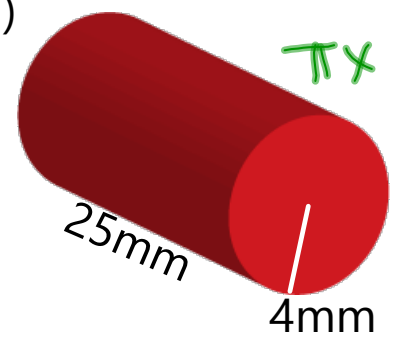
$\pi \times 1.5^2 \times 7$

$V = \pi r^2 h$

1)



2)



$\pi \times 4^2 \times 25$

49.5 cm^3

1260 mm^3

Starter

1) Write down the formula for the volume of a prism

$V = Area \times h$

2) Write down the formula for the area of a triangle

$A = \frac{1}{2} \times b \times h$

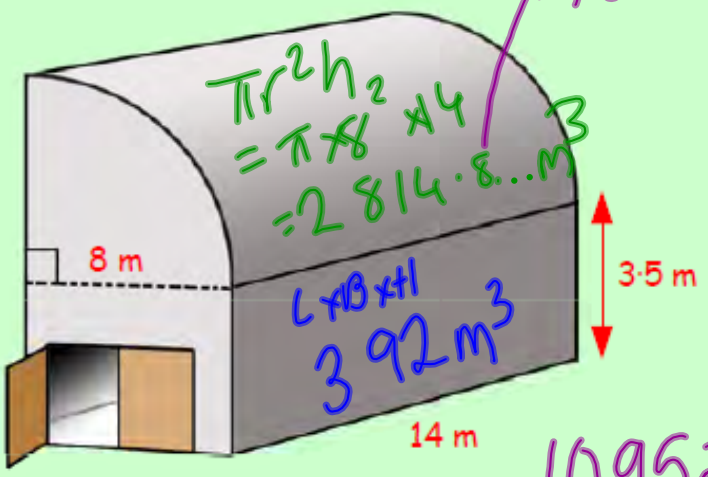
3) Write down the formula for the area of a circle

$A = \pi r^2$

4) Write down the formula for the circumference of a circle

$C = \pi \times d$

This barn consists of a quarter cylinder on top of a cuboid.
Calculate its **total volume** (in m^3).



$\pi r^2 h$
$= \pi \times 8^2 \times 4$
$= 2\,814.8\ldots m^3$
$\div 4$
$703.71\ldots m^3$

$L \times B \times H$
$392 m^3$

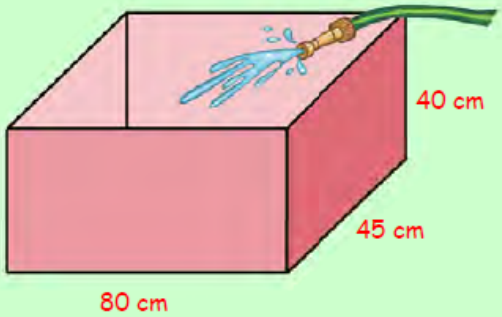
$1095.72 m^3$

Water pours into this tank at a rate of 12 litres per minute.

a Calculate the volume of the tank (in ml).

b Change your answer into litres.

c Calculate how long it will take to fill the tank.



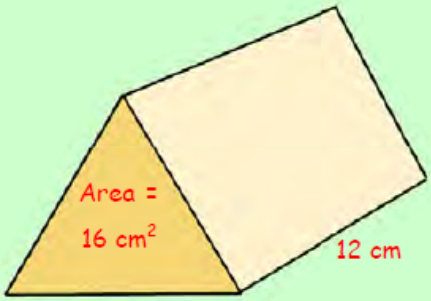
c) $144 \div 12$
$= 12$
12 mins

$L \times B \times H$
$= 80 \times 45 \times 40$
$= 144\,000 cm^3$

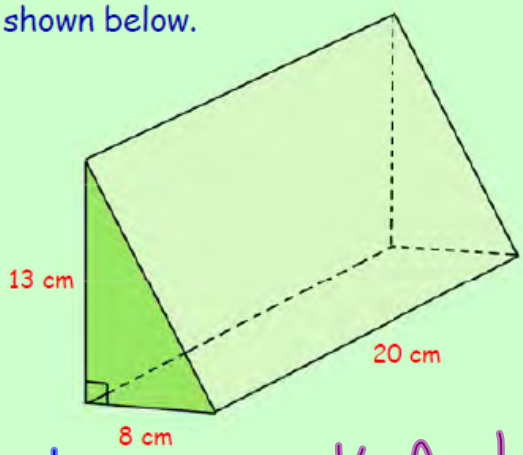
b) $144\,000$ ml $= 144$ L

Calculate the volume of the triangular prisms shown below.

a



b

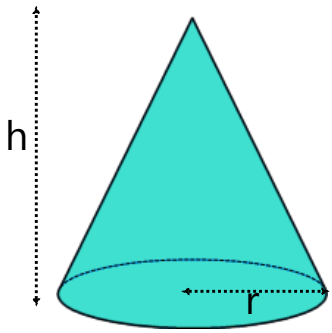


$V = \text{Area} \times h$
$= 16 \times 12$
$= 192\,cm^3$

$A = \frac{1}{2} \times b \times h$
$= \frac{1}{2} \times 8 \times 13$
$= 52\,cm^2$

$V = A \times h$
$= 52 \times 20$
$= 1040\,cm^3$

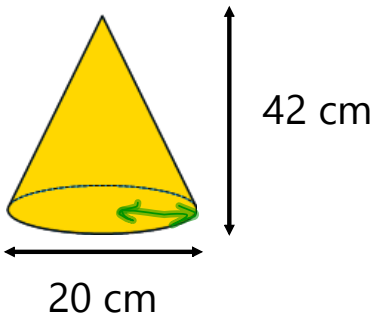
Volume of a Cone



$$V = \frac{1}{3}\pi r^2 h$$

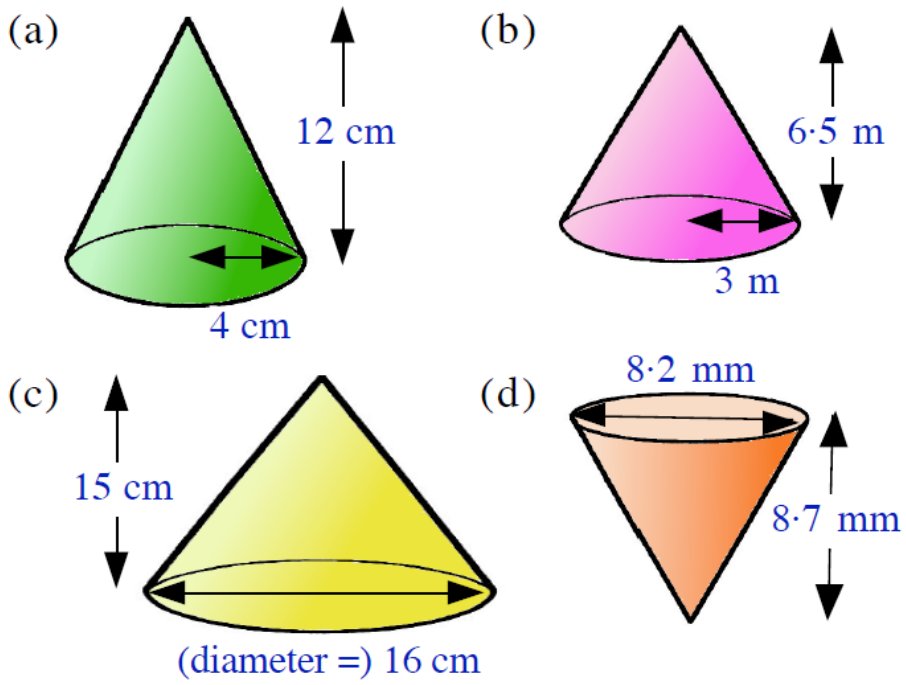
*given in exams

e.g. 1) Calculate the volume of this cone.

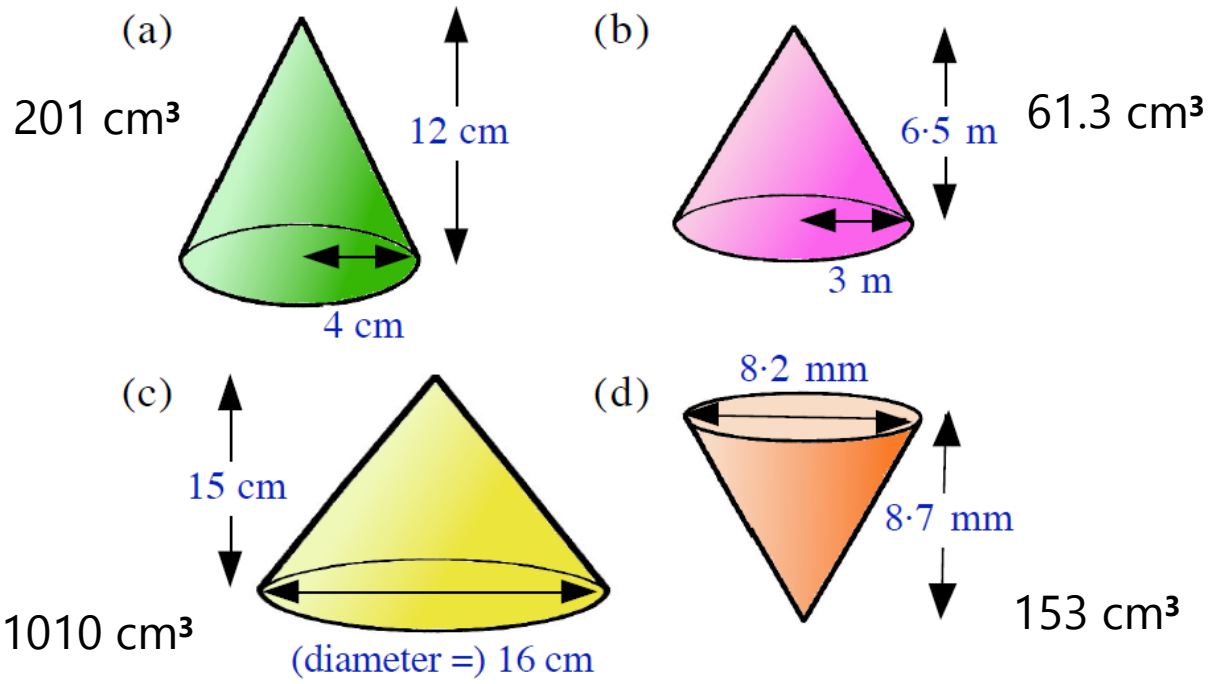


$V = \frac{1}{3}\pi r^2 h$
$= \frac{1}{3} \times \pi \times 10^2 \times 42$
$= 4398\,cm^3$

Calculate the volumes of these cones :-



Calculate the volumes of these cones :- Answers to 3 s.f.



Starter

1) Round 567 ml to 2 significant figures 570 ml

2) Find the volume of a cube with length 0.5 m

$0.5 \times 0.5 \times 0.5 =$

$0.125 m^3$

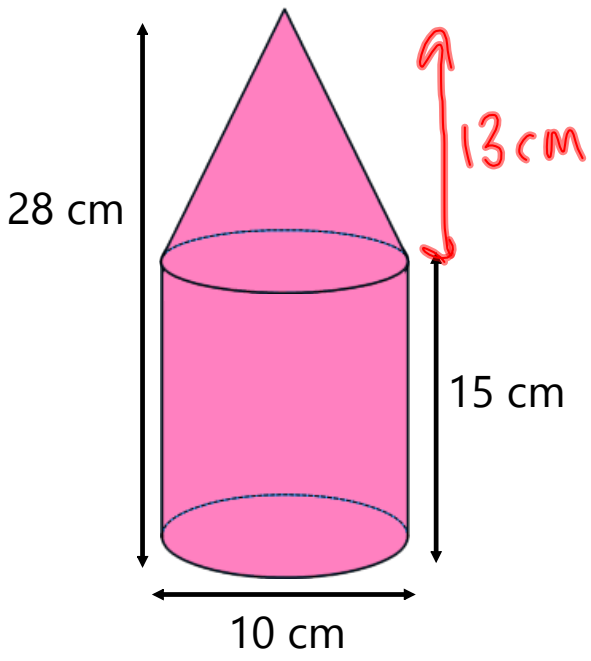
3) Find 20% of £340 without a calculator

10% → £34 20% → £68

4) Write down the formula for the volume of a prism

V = Area × h

Calculate the volume of this shape.



$V = \frac{1}{3} \times \pi \times r^2 \times h$

$= \frac{1}{3} \times \pi \times 5^2 \times 13$

$= 340.3397041$

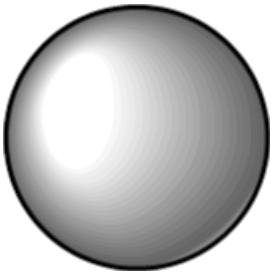
$V = \pi \times r^2 \times h$

$= \pi \times 5^2 \times 15$

$= 1178.097245$

$1518.4 cm^3$

Volume of a Sphere



$$V = \frac{4}{3}\pi r^3$$

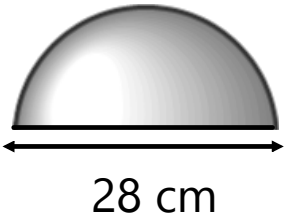
e.g. 1) Find the volume of this sphere.

$V = \frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \pi \times 6^3$

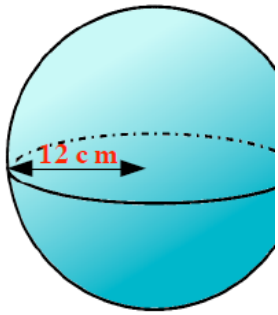
$= 904.78\,cm^3$ (2d.p.)

Find the volume of this hemisphere.



$5747\,cm^3$

1 Calculate the volume of the sphere shown with radius 12 cm.

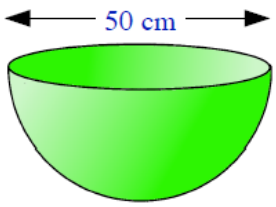


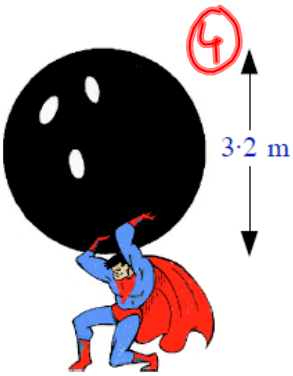
2 Calculate the volume of this golf ball which has a **diameter** of 40 mm.

3 The diameter of this **hemi-spherical** bowl is 50 cm.

(a) Calculate its volume.

(b) How many litres of water would it hold when full ?



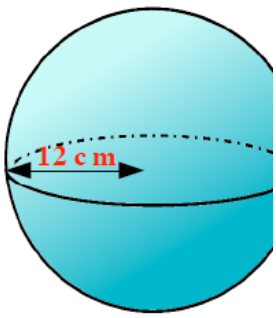


4 This statue is used to advertise "Townend Bowling Club".

Calculate the volume of the sphere used in the sign.

1 Calculate the volume of the sphere shown with radius 12 cm.

7238.2 cm³



2 Calculate the volume of this golf ball which has a **diameter** of 40 mm.

33 510 mm³

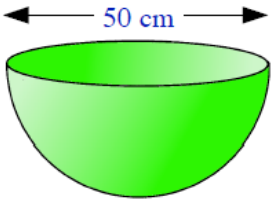
3 The diameter of this **hemi-spherical** bowl is 50 cm.

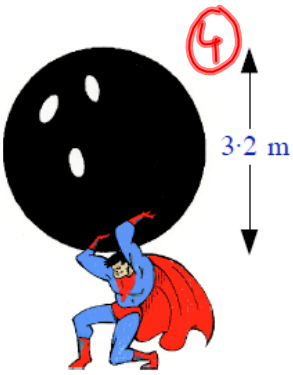
(a) Calculate its volume.

(b) How many litres of water would it hold when full ?

32 724.9 cm³

32.7 L



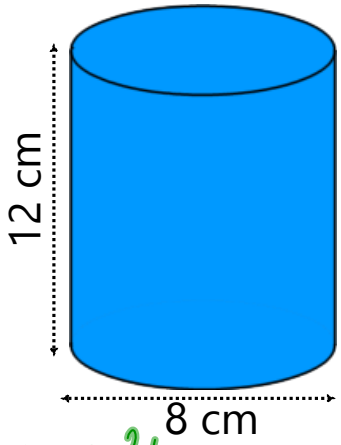


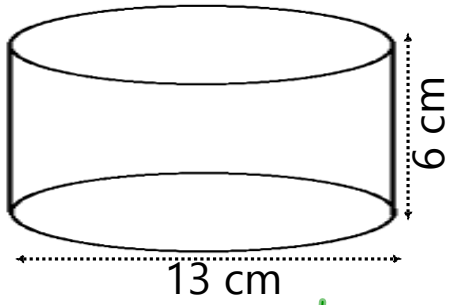
4 This statue is used to advertise "Townend Bowling Club".

Calculate the volume of the sphere used in the sign.

17.157 m³

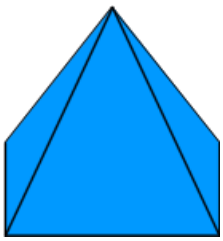
A cylindrical beaker shown on the left is full of water. If the water is poured into the beaker on the right, will it overflow?





$V = \pi r^2 h$
$= \pi \times 4^2 \times 12$
$= 603 cm^3$

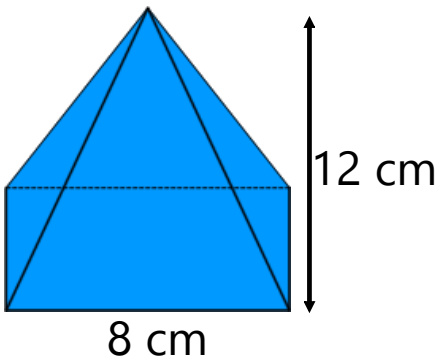
$V = \pi r^2 h$
$= \pi \times 6.5^2 \times 6$
$= 796 cm^3$



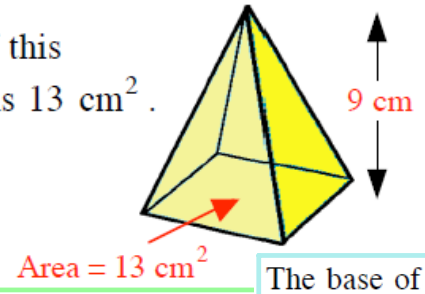
Volume of a Pyramid

$V = \frac{1}{3}$ x base area x perpendicular height

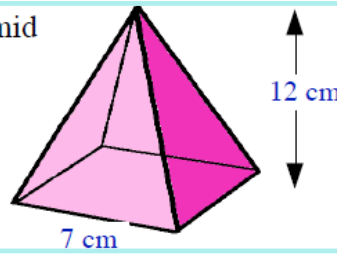
e.g. 1) Find the volume of this square based pyramid.



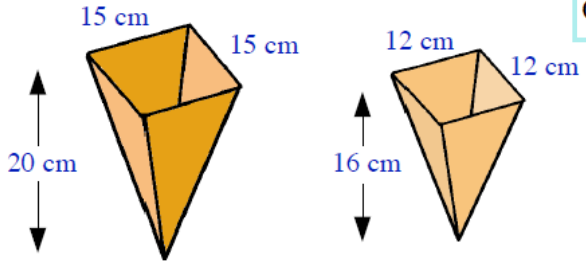
The area of the base of this square based pyramid is 13 cm^2.
Its height is 9 cm.
Calculate its **volume**.



The base of this pyramid is a square with each side 7 cm.
It is 12 cm tall.
Calculate its volume.

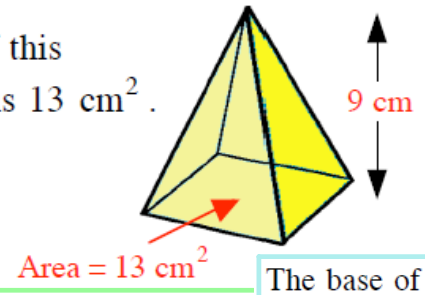


Shown are two cartons used to hold popcorn.



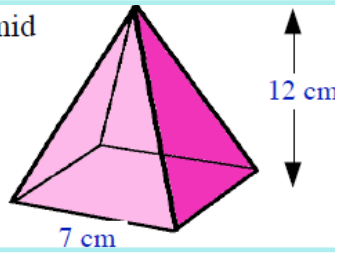
How much **more** does the big one hold than the small one ?

The area of the base of this square based pyramid is 13 cm^2.
Its height is 9 cm.
Calculate its **volume**.



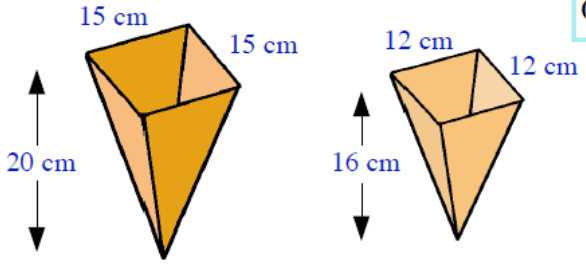
39 cm^3

The base of this pyramid is a square with each side 7 cm.
It is 12 cm tall.
Calculate its volume.



196 cm^3

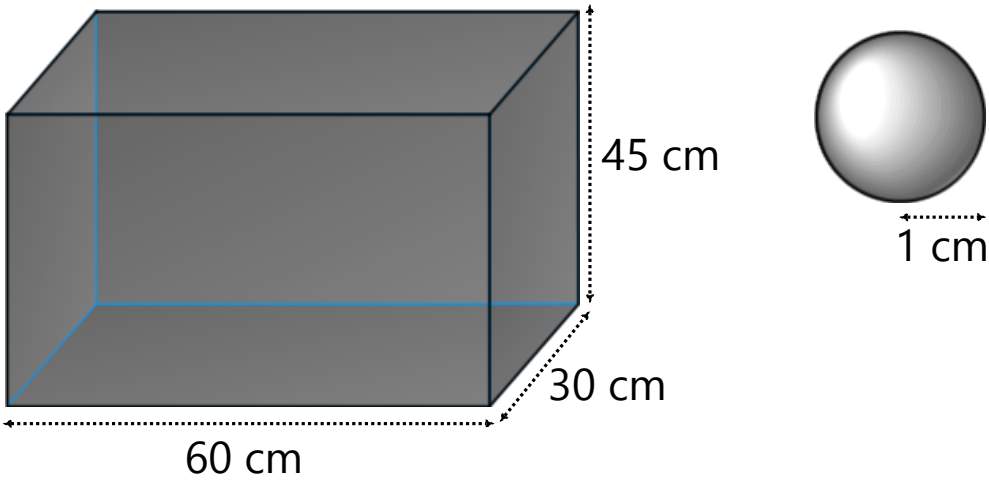
Shown are two cartons used to hold popcorn.



732 cm^3

How much **more** does the big one hold than the small one ?

The rectangular block of metal shown is melted down to make metal balls with radius 1 cm. How many balls can be made?



A paperweight is made of solid plastic. It's height must be 6 cm. The manufacturer must decide between the cone and pyramid shown. Which one requires less plastic to make?