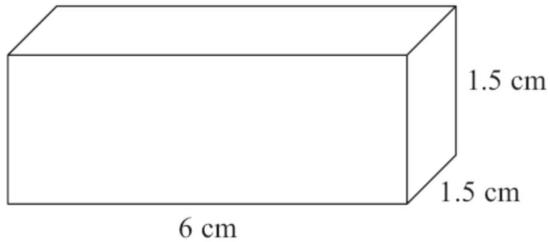# Year 9F Revision
Cuboid – Surface area

Here is a cuboid.

1.5 cm

1.5 cm
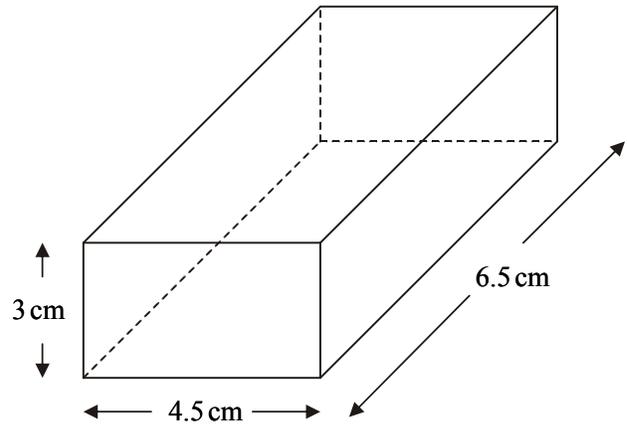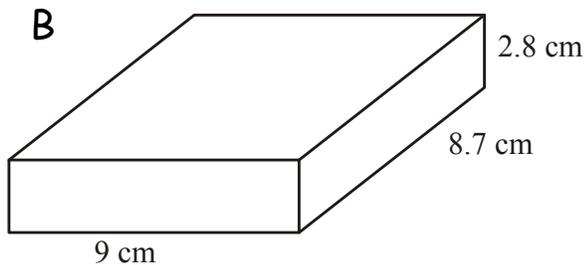
6 cm

The cuboid is 6 cm by 1.5 cm by 1.5 cm.

Work out the total surface area of the cuboid.

Find the surface area.

6.5 cm

3 cm

4.5 cm

Which has the biggest surface area?
Show your working.

A

3 cm

6 cm

12.3 cm

B

2.8 cm

8.7 cm

9 cm
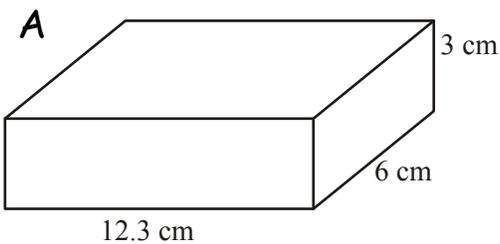
Work out the surface of this cuboid.
Give your answer in terms of x.

$x + 2$

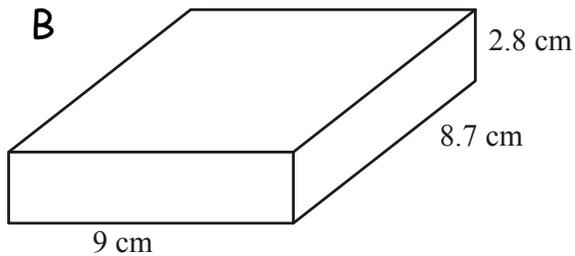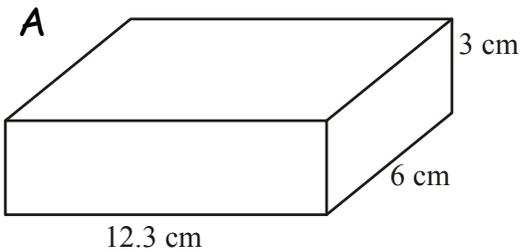$2x + 1$

$5x$
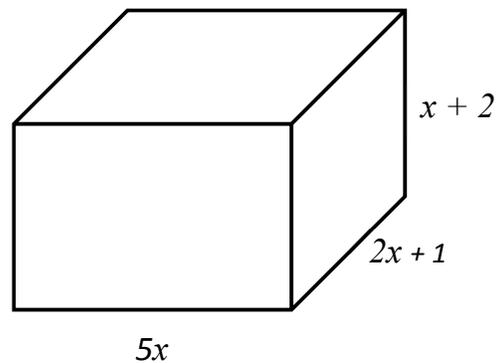
Cuboid – Volume

Here is a cuboid.
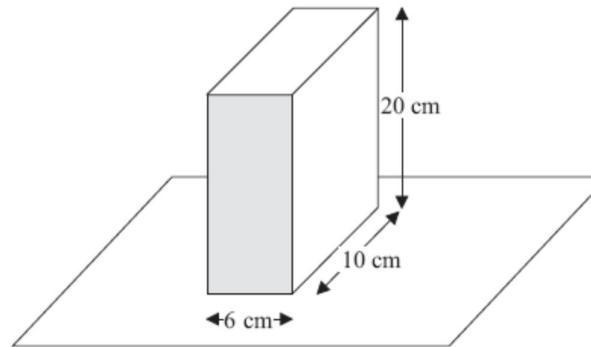Work out the volume of the cuboid.
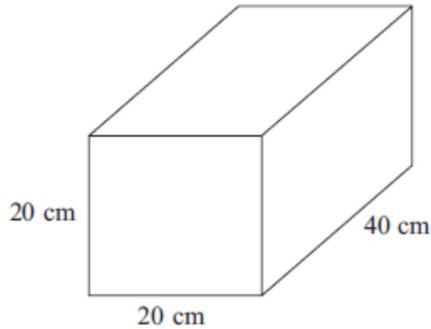
20 cm
40 cm
20 cm

A cuboid has   a volume of 120 cm³,
a length of 6 cm,
a width of 5 cm.

Work out the height of the cuboid.

Which has the biggest volume?
Show your working.

A

3 cm
6 cm
12.3 cm

B

2.8 cm
8.7 cm
9 cm

Jane has a carton of orange juice.
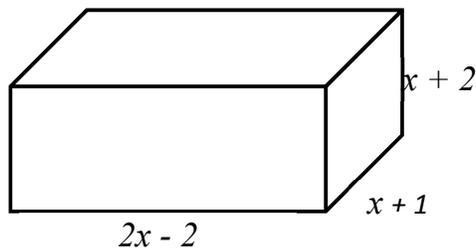The carton is in the shape of a cuboid.

20 cm
10 cm
6 cm

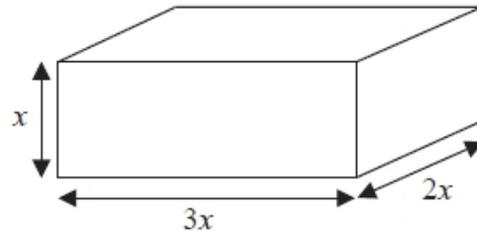The depth of the orange juice in the carton is 8 cm.

Jane closes the carton.
Then she turns the carton over so that it stands on the shaded face.

Work out the depth, in cm, of the orange juice now.

Work out the volume this cuboid.
Give your answer in terms of x.

x + 2
x + 1
2x - 2

Here is a cuboid.

x
3x
2x

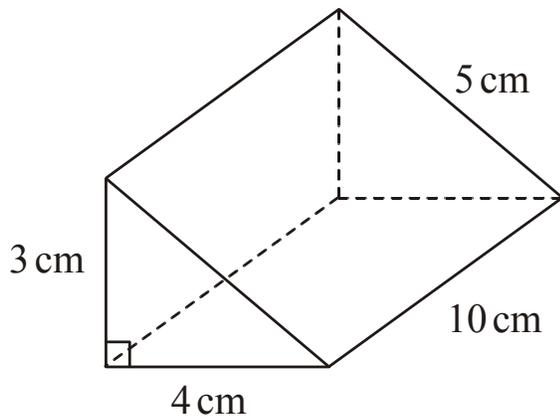All measurements are in centimetres.
x is an integer.
The volume of the cuboid is less than 900cm³
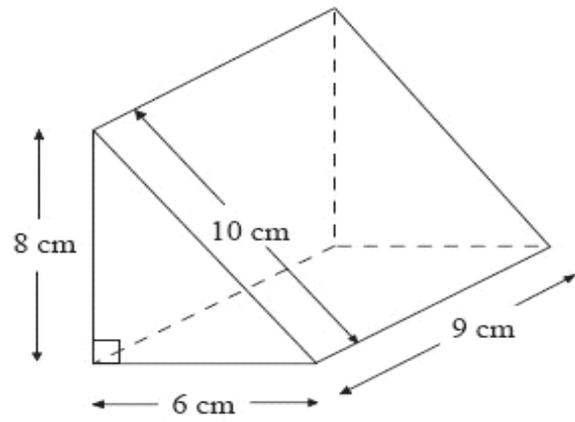Show that $x \leq 5$.
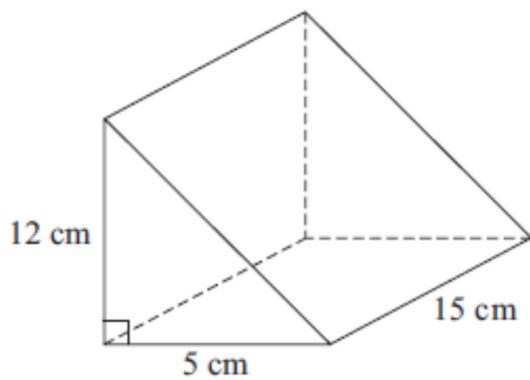
Triangular Prism – Surface area

What is the total surface area of this triangular prism?

5 cm

3 cm

4 cm

10 cm

Find the surface area of this triangular prism.
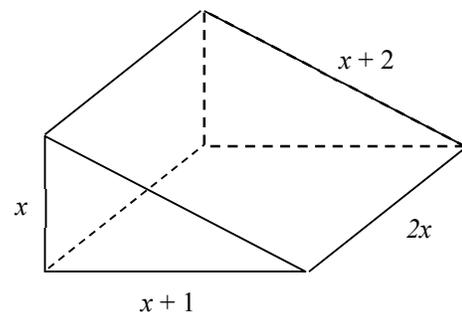
8 cm

10 cm

6 cm

9 cm

Find the surface area of this triangular prism.

12 cm

5 cm

15 cm

Find the surface area of this triangular prism.
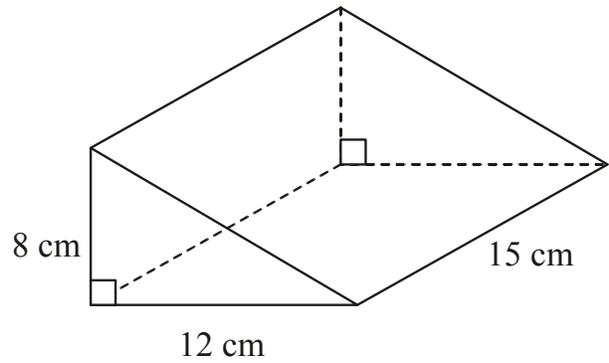Give your answer in terms of x.

$x + 2$

x

$x + 1$

$2x$

Triangular Prism – Volume

Find the volume of this triangular prism.

12 cm

15 cm

5 cm

Find the volume of this triangular prism.

8 cm

15 cm
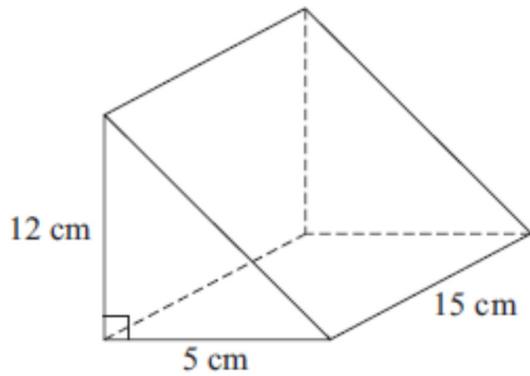
12 cm

What is the volume of this prism?

5 cm

10 cm

4 cm

Find the volume of this triangular prism.

13 cm

15 cm
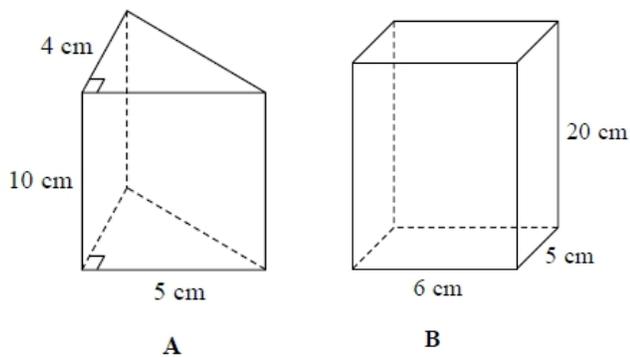
5 cm
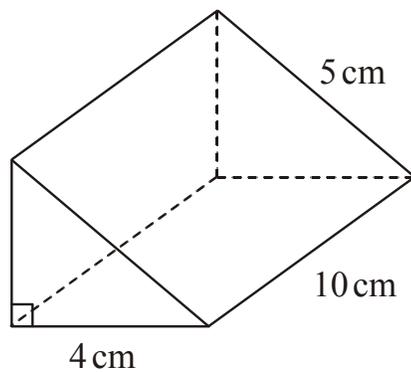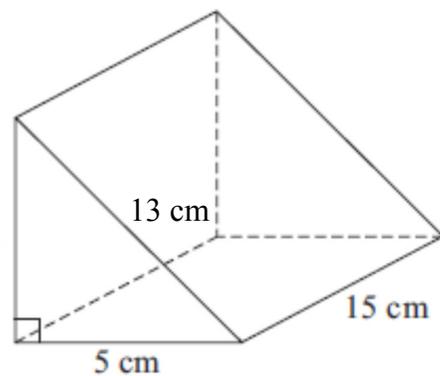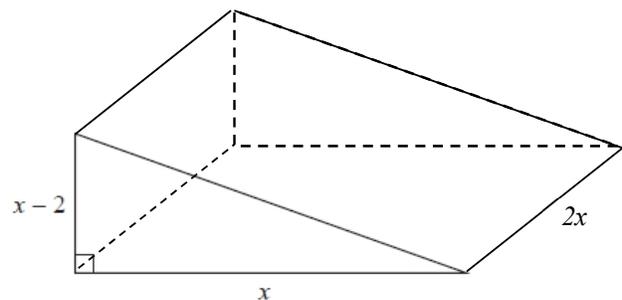
The diagram shows a right-angled triangular prism **A** and a cuboid **B**.

Show that the volume of **B** is 6 times the volume of **A**.

4 cm

10 cm

5 cm

A

20 cm

6 cm

5 cm

B

Find the volume of this triangular prism. Give your answer in terms of x.

$x - 2$

$2x$

x

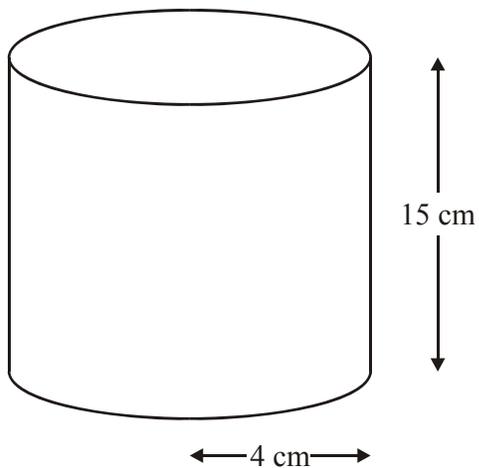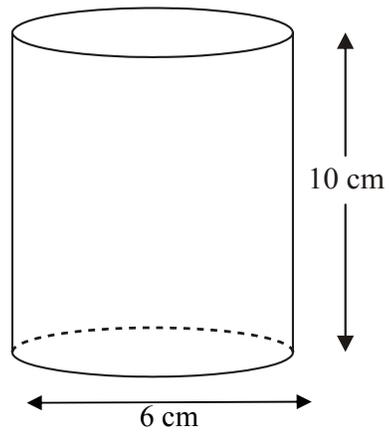# Cylinder – Volume

Calculate the volume of the cylinder.

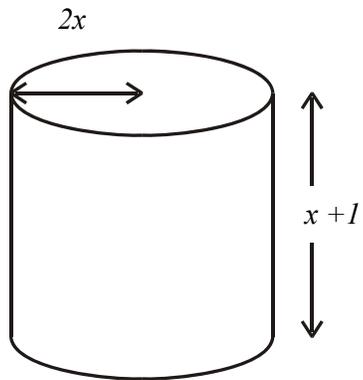Work out the volume of the cylinder.

Give your answer correct to 3 s.f.

15 cm

4 cm

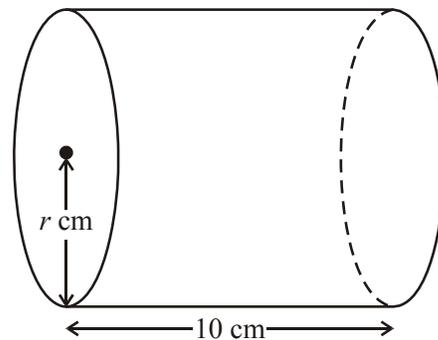Give your answer correct to 3 s.f.

10 cm

6 cm

Work out the volume of the cylinder.
Give your answer in terms of *x*.

2x

x +1

The volume of the cylinder is 140 cm³.
Work out the value of *r*.
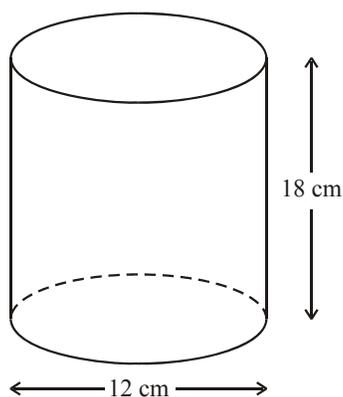Give your answer correct to 1 d.p..

r cm

10 cm

Cylinder – Surface Area

The diagram shows a solid cylinder.
The cylinder has a diameter of 12 cm and a height of 18 cm.

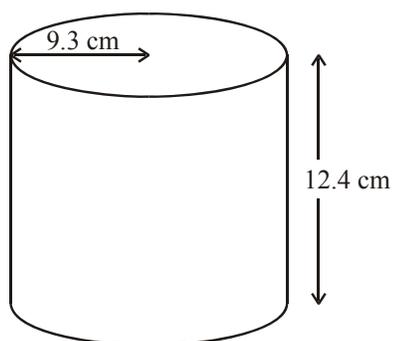Calculate the **total** surface area of the cylinder.

Give your answer correct to 3 significant figures.

18 cm

12 cm

The diagram shows a solid cylinder.
The radius of the cylinder is 9.3 cm.
Its height is 12.4 cm.

Calculate the **total** surface area of the cylinder.
Give your answer correct to 3 significant figures.

9.3 cm

12.4 cm

The diagram shows a solid cylinder.
The cylinder has a radius of x cm and a height of $(3x - 4)$ cm.

Calculate the **curved** surface area of the cylinder.

Give your answer in terms of x.

$3x - 4$

x
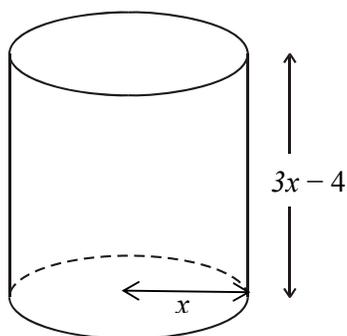
The diagram shows a solid cylinder.
The cylinder has a diameter of $(2x)$ cm and a height of $(x + 2)$ cm.
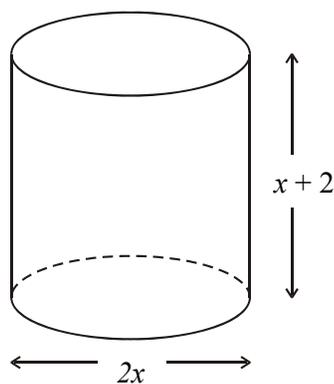
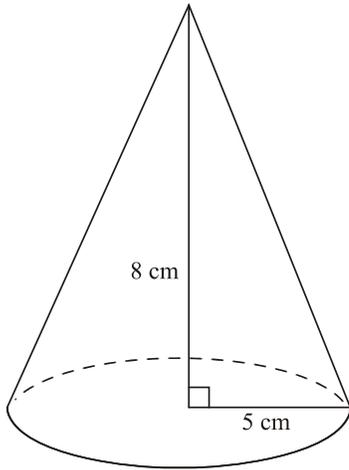Calculate the **total** surface area of the cylinder.
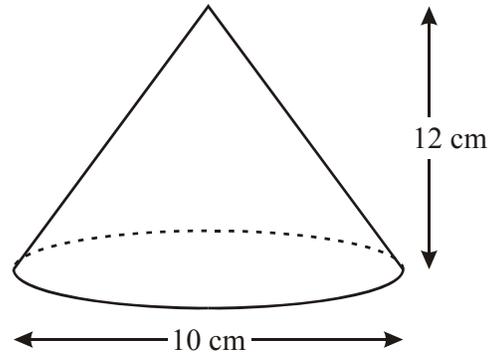
Give your answer in terms of x.

$x + 2$

$2x$

Cone – Volume

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

Calculate the volume of the cone.
Give your answer correct to 3 s.f.

8 cm

5 cm

Calculate the volume of the cone.
Give your answer correct to 3 s.f.

12 cm

10 cm
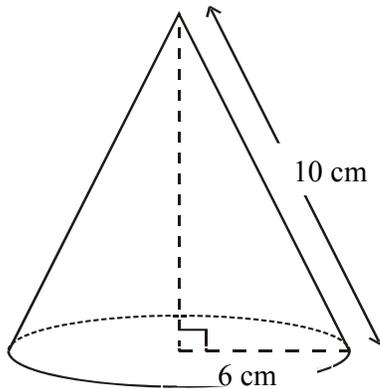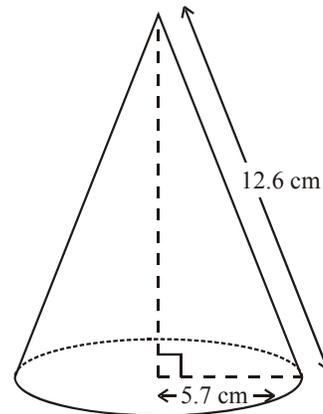
Calculate the volume of the cone.
Give your answer correct to 3 s.f.

10 cm

6 cm

Calculate the volume of the cone.
Give your answer correct to 3 s.f.
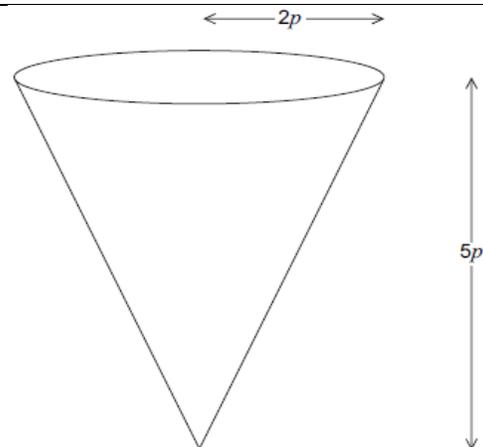
12.6 cm

5.7 cm
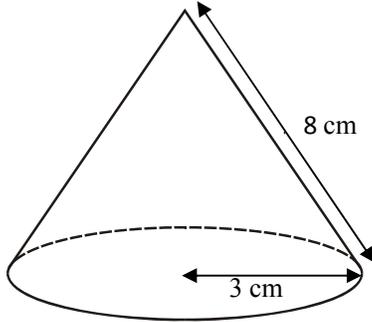
This right circular cone has radius 2p
and height 5p.
The dimensions are in centimetres.

The volume of the cone is 22500π cm³.
Work out the value of p

2p

5p

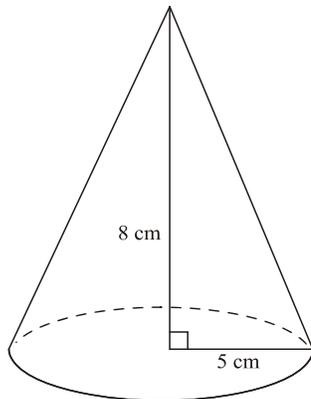## Cone – Surface area
$$\textit{Surface area Cone} = \pi r l$$

The slant height of a cone is 8 cm.
The radius of the cone is 3 cm.
Find the curved surface area of the cone.
Give your answer in terms of π.

8 cm

3 cm

The slant height of a cone is 12.6 cm.
The radius of the cone is 5.7 cm.
Find the curved surface area of the cone.
Give yo ur answer correct to 3 s.f..

12.6 cm

← 5.7 cm →
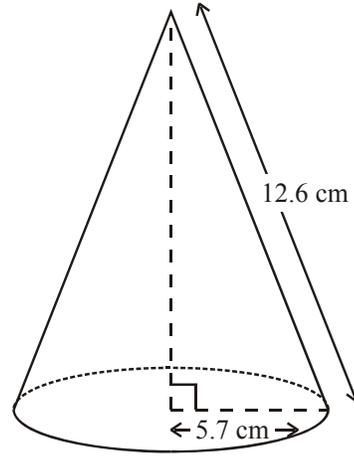
A cone has a base radius of 5 cm and a vertical height of 8 cm.
Calculate the curved surface area of the cone.
Give your answer correct to 3 significant figures.

8 cm

5 cm

The diagram represents a cone.
The height of the cone is 12 cm.
The diameter of the base of the cone is 10cm.

Calculate the curved surface area of the cone. Give your answer as a multiple of π.

12 cm

10 cm
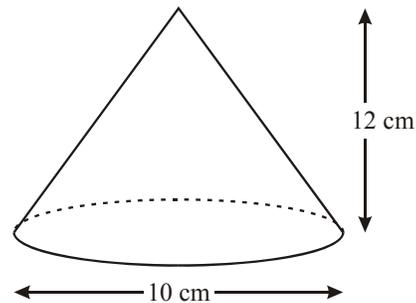
The cone has radius 3 cm and slant height l cm.
The **total** surface area, including the base,
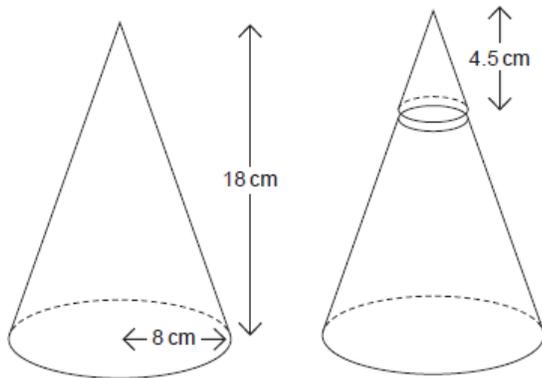is 24π cm².

Work out the length l.

l cm

← 3 cm →
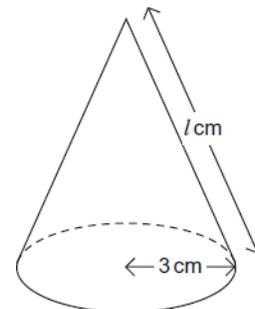
Frustum

$$Volume\ of\ cone = \frac{1}{3}\pi r^2 h \qquad Surface\ area\ Cone = \pi r l$$
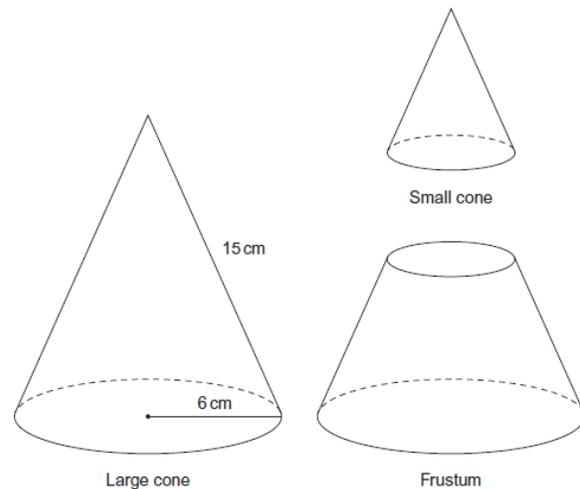
A cone has a vertical height of 18 cm and a base radius of 8 cm.

A cut is made parallel to the base so that a cone of height 4.5 cm is removed.

Calculate the volume of the remaining frustum.

A frustum is made by cutting a small cone from the top of a large cone as shown.

The slant height of the large cone is 15cm and the radius of the base is 6cm.
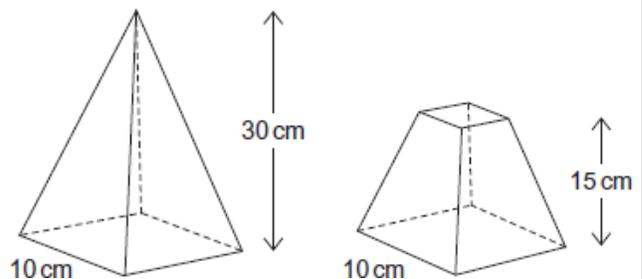
The height of the small cone is half the height of the large cone.

Work out the **curved** surface area of the frustum.

A pyramid has a square base of side 10 cm a height of 30 cm

It is cut horizontally at a height of 15 cm The top pyramid is removed to leave this frustum.

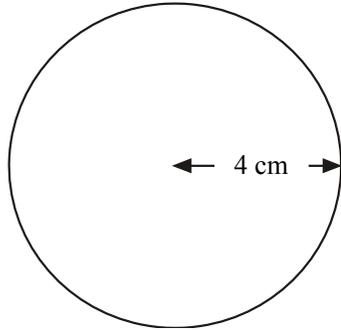Calculate the volume of the frustum.

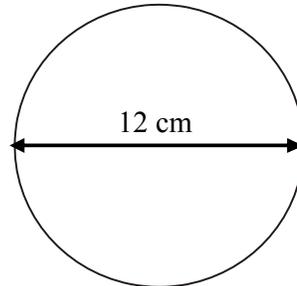## Sphere – Volume
$$Volume\ of\ sphere = \frac{4}{3}\pi r^3$$

A sphere has a radius of 4 cm.

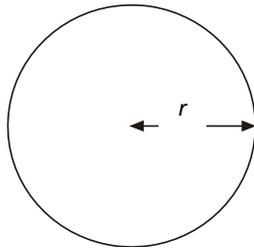Calculate the volume of the sphere.
Give your answer correct to 3 s.f.

← 4 cm →

A sphere has a diameter of 12 cm.

Calculate the volume of the sphere.
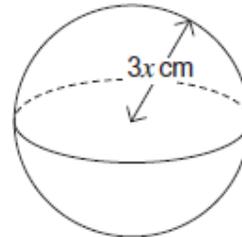Give your answer correct to 3 s.f.

12 cm

A sphere has a volume of 500 cm³.

Calculate the radius of the sphere.
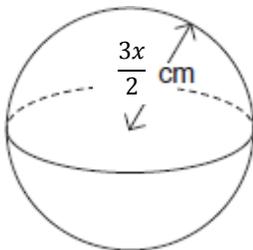Give your answer correct to 3 s.f.

← r →

A sphere has a radius of $3x$ cm.

Work out the volume of this sphere.
Give your answer in terms of x.

$3x$ cm

A sphere has radius $\frac{3x}{2}$ cm.

$\frac{3x}{2}$ cm

Write down an expression for the volume of
the sphere in terms of π and x.
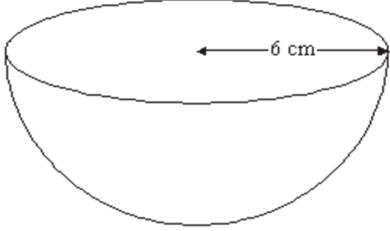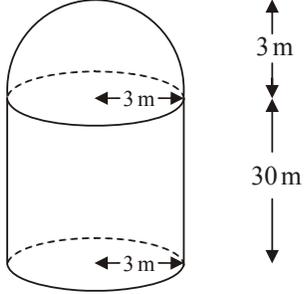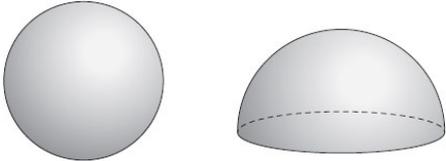Give your answer in its simplest form.

A sphere has radius x centimetres.

A hemisphere has radius y centimetres.
The shapes have equal volumes.

Work out the value of $\frac{y}{x}$

Give your answer in the form $a^{\frac{1}{3}}$ where a is
an integer.

Sphere – Surface Area
Surface area of sphere $= 4\pi r^2$

The radius of a sphere is 5 cm. Calculate the surface area of the sphere. Give your answer in terms of π.	The diameter of a sphere is 13 cm. Calculate the surface area of the sphere. Give your answer correct to 3 significant figures.
The diagram below shows a hemisphere. 6 cm Calculate the total surface area of the hemisphere. Give your answer correct to 3 significant figures.	Calculate the total surface area of this solid. Give your answer in terms of π. 3 m 3 m 30 m 3 m
The surface area of a sphere is 2700 cm². Calculate the diameter of the sphere to the nearest mm.	The radius of a sphere is $\frac{x}{2}$ cm. Calculate the surface area of the sphere. Give your answer in terms of x.

The diagram shows a sphere, radius 6 cm, and a solid hemisphere, radius 9 cm.

Work out the ratio

 surface area sphere : total surface area of hemisphere
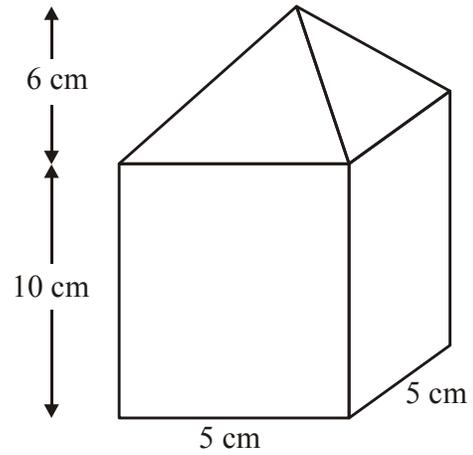
Give your answer in its simplest form.

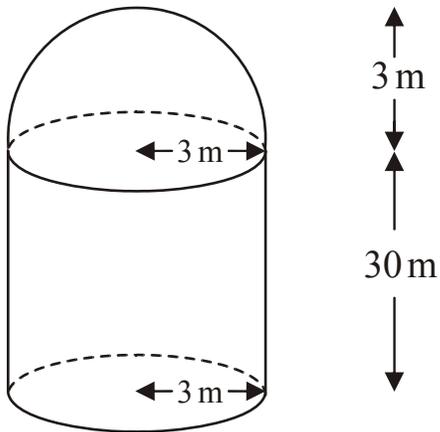# Compound solids – Volume
$$Volume\ of\ sphere = \frac{4}{3}\pi r^3$$

Calculate the total volume of the solid.
Give your answer correct to 3 s.f..
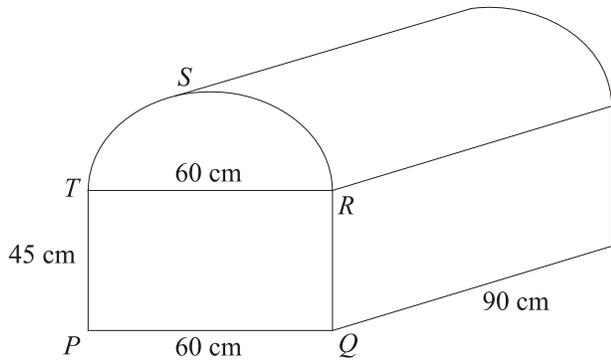
S

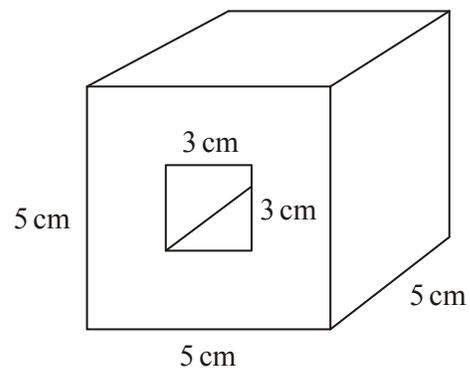60 cm

T

R

45 cm

90 cm

P   60 cm   Q

Calculate the total volume of the solid.

6 cm

10 cm

5 cm

5 cm

5 cm

Calculate the total volume of the solid.
Give your answer correct to 3 s.f..

3 m

←3 m→

30 m

←3 m→
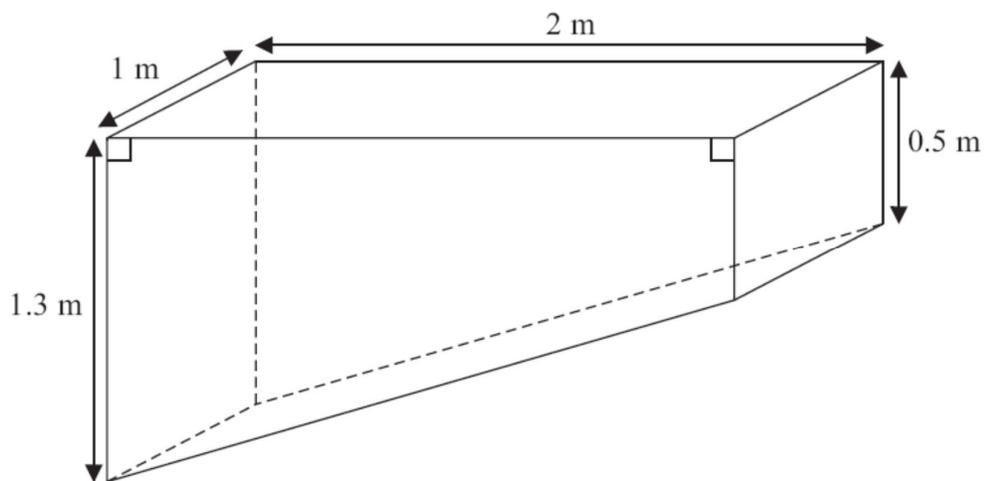
Work out the volume of the solid.
Give your answer correct to 3 s.f..

3 cm

5 cm   3 cm

5 cm

5 cm

Prism – Volume

The diagram shows a prism.
Work out the volume of the prism.

4 cm

7 cm

2 cm

10 cm

9 cm
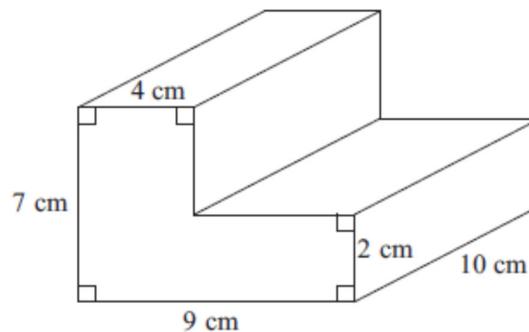
Sophie has a fish pond in the shape of a prism.

Work out the volume of the pond.

2 m

1 m

0.5 m

1.3 m

A water trough is in the shape of a prism.
Harry fills the trough completely.

What is its volume?

30 cm

120 cm

20 cm

20 cm

40 cm

40 cm

40 cm

80 cm