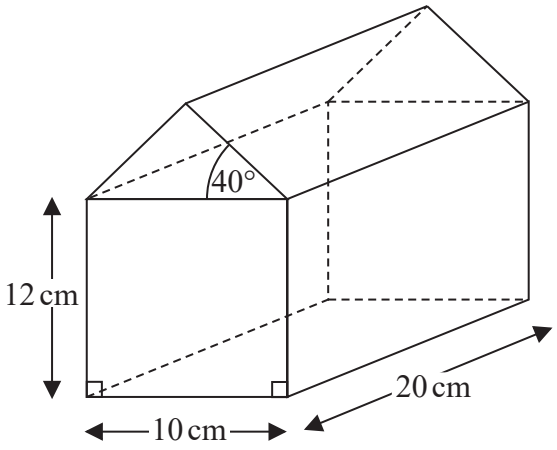
**1** The diagram shows a prism.



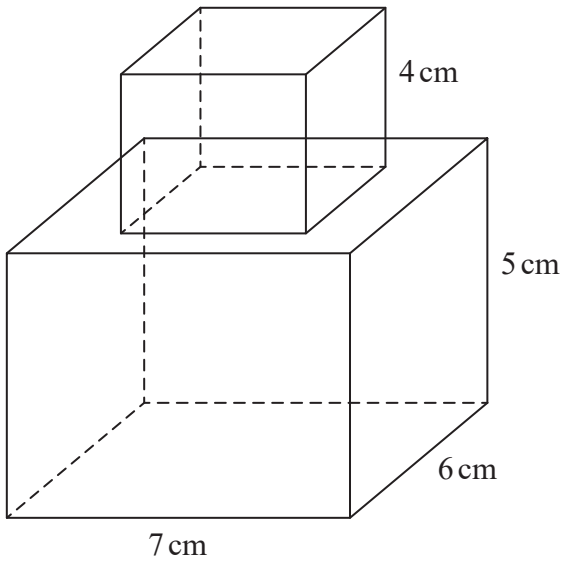

The cross section of the prism has exactly one line of symmetry.

Work out the volume of the prism.
Give your answer correct to 3 significant figures.

..... $cm^3$

**(Total for Question 1 is 5 marks)**

**2** A cube is placed on top of a cuboid, as shown in the diagram, to form a solid.



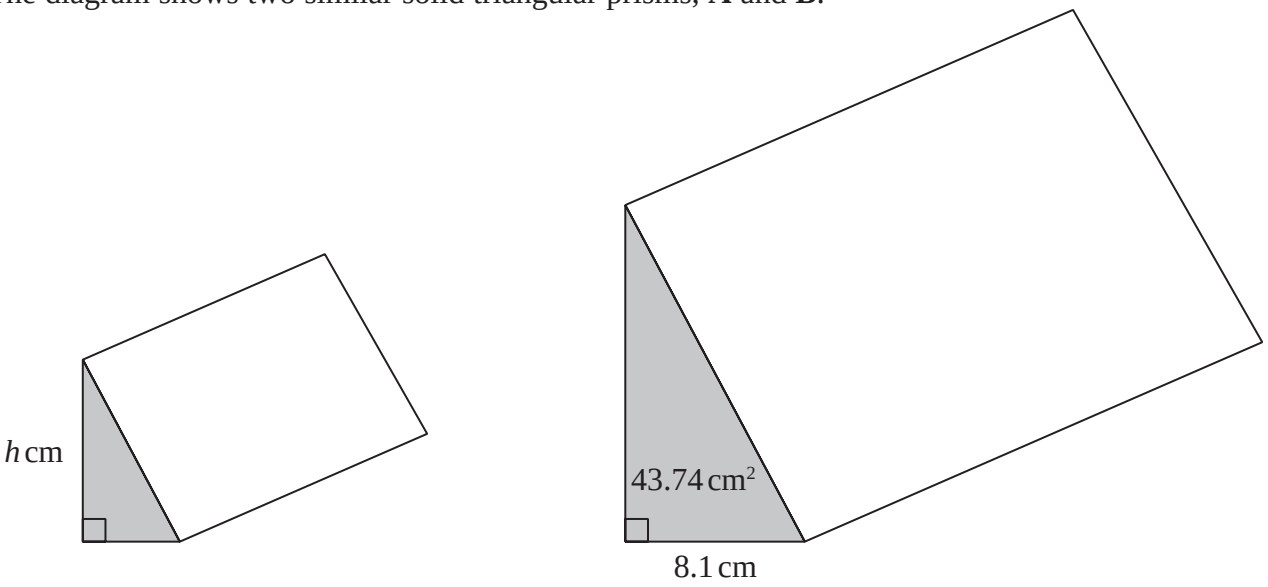

The cube has edges of length 4 cm.
The cuboid has dimensions 7 cm by 6 cm by 5 cm.

Work out the total surface area of the solid.

..... $cm^2$

**(Total for Question 2 is 3 marks)**

**3** The diagram shows two similar solid triangular prisms, **A** and **B**.




Prism **A** Prism **B**

The volume of prism **A** is 58.806 $cm^3$
The volume of prism **B** is 1587.762 $cm^3$

The cross section of each prism is a right-angled triangle.

For prism **B**
the length of the base of the triangle is 8.1 cm
the area of the triangle is 43.74 $cm^2$

The height of the triangle for prism **A** is $h$ cm.

Work out the value of $h$.

$h$ = .....

**(Total for Question 3 is 4 marks)**

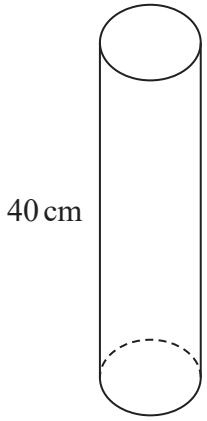
**4** A cube has a total surface area of $150\,cm^2$

Work out the volume of the cube.

..... $cm^3$

**(Total for Question 4 is 4 marks)**

**5** The diagram shows a solid cylinder on a horizontal floor.




$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The cylinder has a

volume of $1200\,\text{cm}^3$
height of 40 cm.

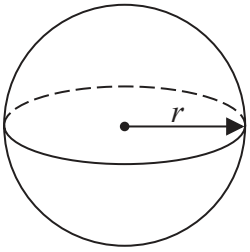
The cylinder exerts a force of 90 newtons on the floor.

Work out the pressure on the floor due to the cylinder.

..... newtons/$\text{cm}^2$

**(Total for Question 5 is 3 marks)**

**6** Here is a sphere.




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

$\frac{3}{8}$ of the surface area of this sphere is $75\pi\,\text{cm}^2$

Find the diameter of the sphere.
Give your answer in the form $a\sqrt{b}$ where $a$ is an integer and $b$ is a prime number.

..... cm

**(Total for Question 6 is 4 marks)**

**7** A solid cuboid is made of metal.

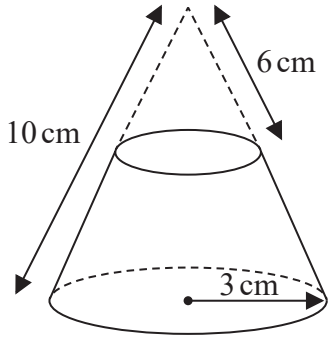
The metal has a density of $9\,g/cm^3$
The volume of the cuboid is $72\,cm^3$

Work out the mass of the cuboid.

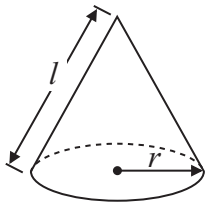
..... g

**(Total for Question 7 is 2 marks)**

**8** A solid frustum is made by removing a small cone from a large cone as shown in the diagram.




Curved surface area of cone = $\pi rl$




The slant height of the small cone is 6 cm.
The slant height of the large cone is 10 cm.
The radius of the base of the large cone is 3 cm.

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

..... $cm^2$

**(Total for Question 8 is 5 marks)**

**9** A solid cuboid has a volume of $300\,cm^3$
The cuboid has a total surface area of $370\,cm^2$

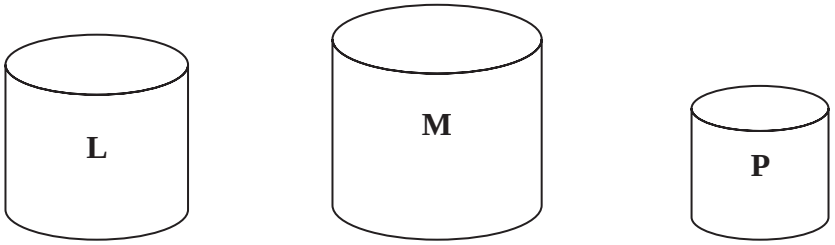
The length of the cuboid is 20 cm.
The width of the cuboid is greater than the height of the cuboid.

Work out the height of the cuboid.
You must show all your working.

..... cm

**(Total for Question 9 is 5 marks)**

**10** **L**, **M** and **P** are three similar solid cylinders made from the same material.




**L** has a mass of 64 g
**M** has a mass of 125 g

**M** has a total surface area of 144 $cm^2$
**P** has a total surface area of 16 $cm^2$

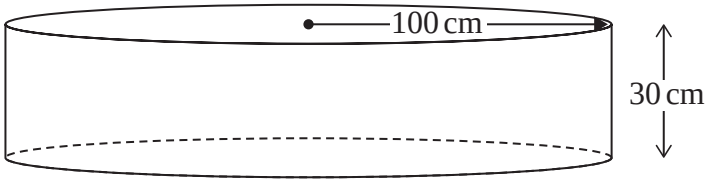
Work out

height of cylinder **L** : height of cylinder **M** : height of cylinder **P**

.....

**(Total for Question 10 is 4 marks)**

**11** A paddling pool is in the shape of a cylinder.




The pool has radius 100 cm.
The pool has depth 30 cm.

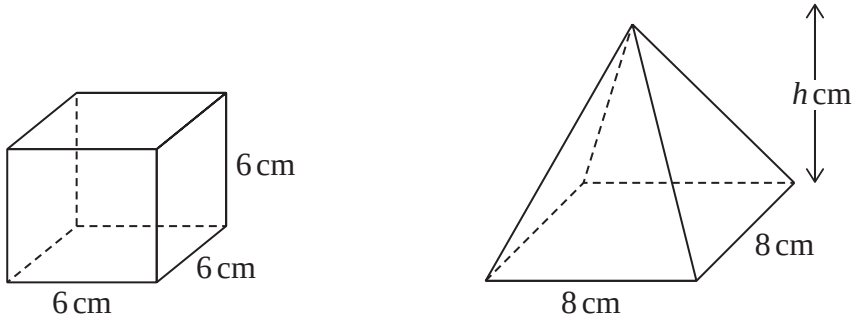
The pool is empty.
It is then filled with water at a rate of 250 $cm^3$ per second.

Work out the number of minutes it takes to fill the pool completely.
Give your answer correct to the nearest minute.
You must show all your working.

..... minutes

**(Total for Question 11 is 4 marks)**

**12** The diagram shows a cube and a square-based pyramid.




The volume of the cube is equal to the volume of the pyramid.

Work out the perpendicular height, $h$ cm, of the pyramid.

..... cm

**(Total for Question 12 is 3 marks)**