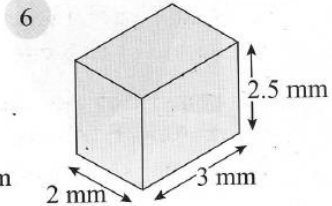
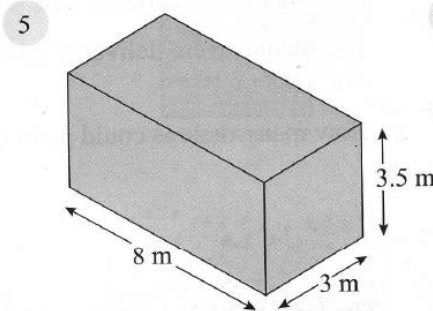
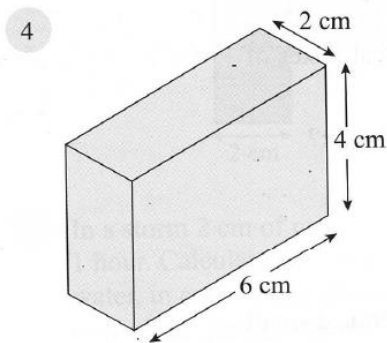
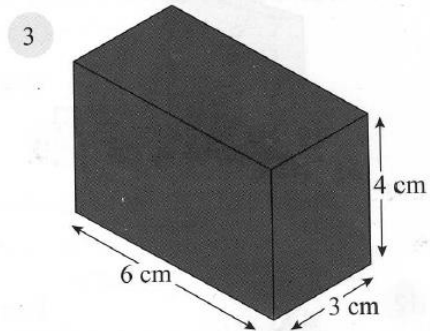
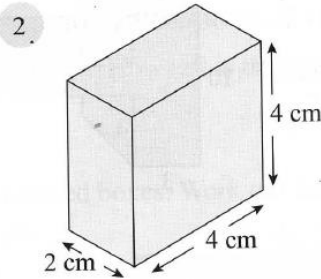
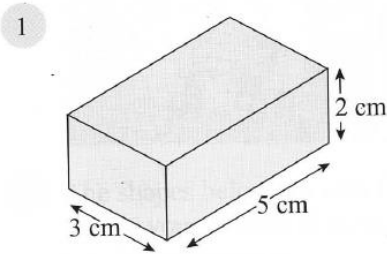


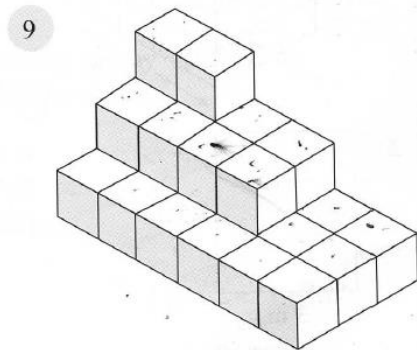
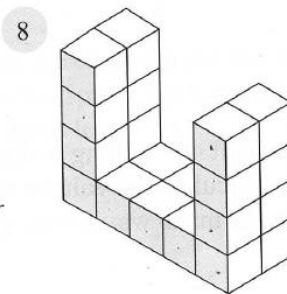
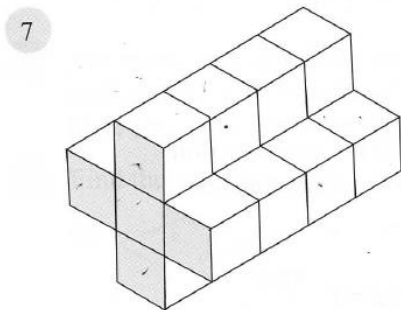
Volume of Objects

Exercise A

In questions 1 to 6 work out the volume of each cuboid. Give your answer in the correct units

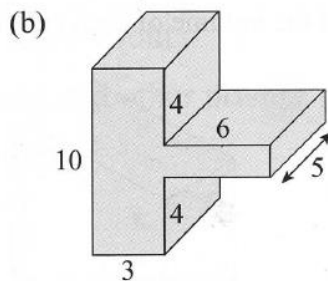
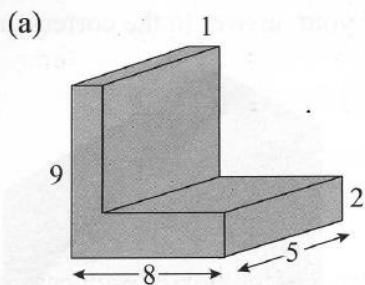


In questions 7 to 9 write down the volume of the object. All the objects are made from centimetre cubes.



- 10 (a) Draw a sketch of a 4 m by 4 m by 2 m cuboid.
 (b) Calculate the volume of the cuboid.
 (c) Calculate the total surface area of the cuboid.

11 Calculate the volume of each girder by splitting them into cuboids. All lengths are in cm.



12



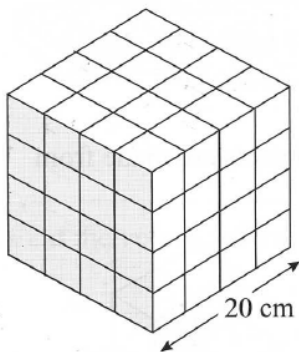
Farmers were asked to redesign their melons so that they could fit more melons into delivery boxes. They grew melons as cubes of side 16 cm.

The melons were delivered in cubical boxes of side 1.28 m.

How many melons could go in each box?

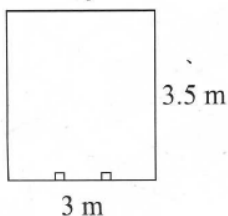
Exercise B

1



The large cube is cut into lots of identical small cubes as shown. Calculate the volume of each small cube.

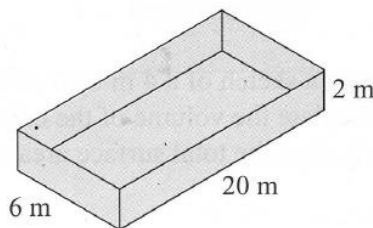
2



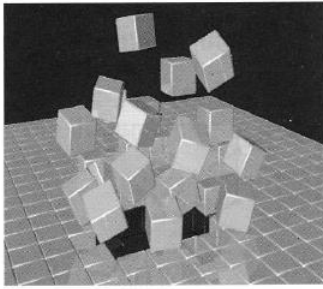
A mine shaft 400 m long is dug with the cross-section shown. Calculate the volume of earth which must be removed to make way for the shaft.

3

The diagram shows an empty swimming pool. Water is pumped into the pool at a rate of 2 m^3 per minute. How long will it take to fill the pool?



4



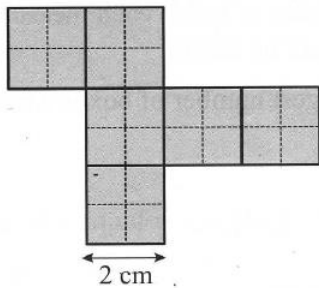
Gold cubes of side 3 cm are placed together in a flat square measuring 210 cm by 210 cm.

The cubes are used to make a square-based column with a side of 15 cm.

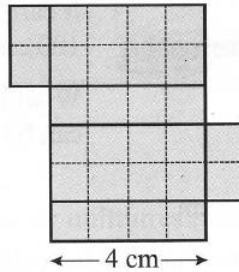
How tall is the column?

5 The shapes below are nets for closed boxes. Work out the volume of the box in each case, giving your answer in cubic cm.

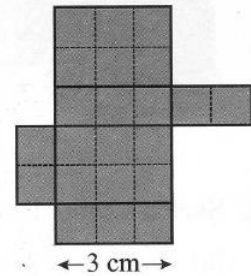
(a)



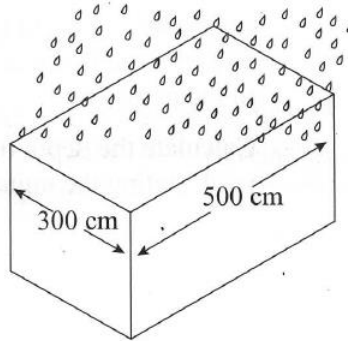
(b)



(c)



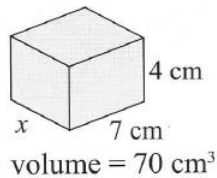
6 In a storm 2 cm of rain fell in 1 hour. Calculate the volume of water, in cm^3 , which fell on the roof of the garage shown.



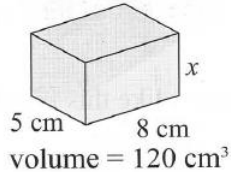
7 The inside of a spaceship orbiting the earth is a cuboid measuring 3 m by 4 m by 2 m. Unfortunately air is leaking from the spaceship at a rate of $1000 \text{ cm}^3/\text{sec}$. How long will it take for all the air to leak out?

8 Find the length x .

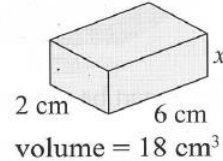
(a)



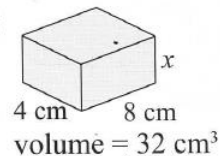
(b)



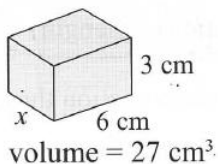
(c)



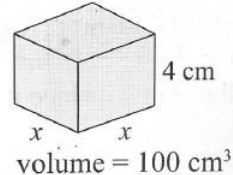
(d)



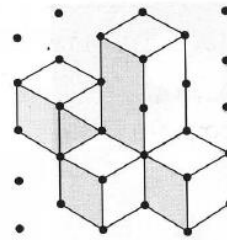
(e)



(f)



- 9 The diagram shows an object of volume 7 cm^3 . Use isometric paper to draw the following objects:
- a cuboid with volume 45 cm^3
 - a T-shaped object with volume 15 cm^3
 - an L-shaped object with volume 20 cm^3
 - any object with a volume of 23 cm^3 .



10



The internal dimensions of the container with this lorry are 7 m by 4.2 m by 2.8 m.

It carries a number of boxes each measuring 100 cm by 98 cm by 85 cm.

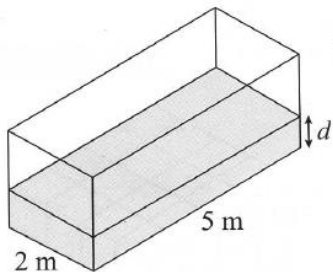
What is the largest number of boxes which can be loaded?

11

Sketch a cuboid $a \text{ cm}$ $b \text{ cm}$ by $c \text{ cm}$.

- Write an expression for the volume of the cuboid.
- Write an expression for the total surface area of the cuboid.

12



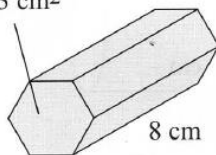
A children's paddling pool has a base 2 m by 5 m. There is 5 m^3 of water in the pool.

Calculate the depth of water d in the pool, stating the units clearly.

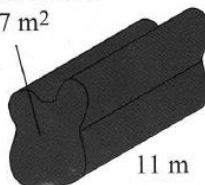
Exercise C

Find the volume of each prism.

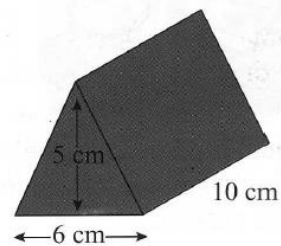
- 1 Area of end = 3 cm^2
Area of end = 3 cm^2



- 2 Area of end = 7 m^2
Area of end = 7 m^2



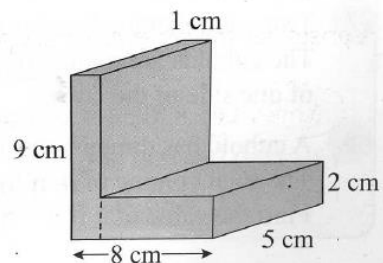
3



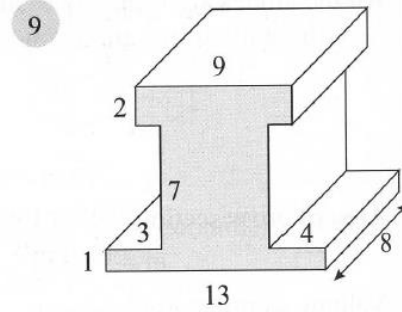
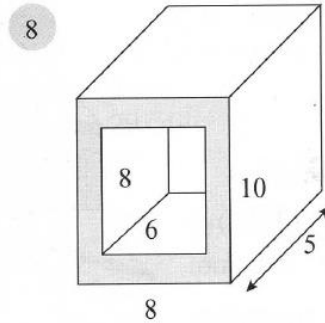
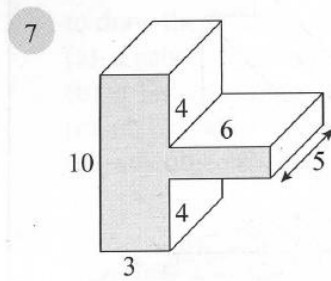
- 4 5 cm 4 cm 2 cm
-

- 5 3 m 1 m 7 m
-

6



In questions 7 to 9 find the volume of each prism. All the angles are right angles and the dimensions are in centimetres.

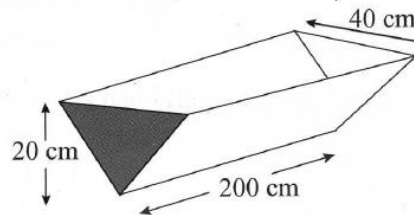


Exercise D

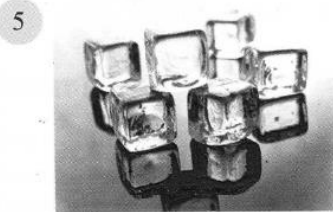
1 A uniform metal rod of length 5 m has a volume of 3750 cm^3 . Find the area of the cross-section of the rod.

2 A vertical tower of height 32 m has a square cross-section. Find the length of a side of the square if the volume of the tower is 4608 m^3 .

3 Find the volume, in litres, of the water trough shown.

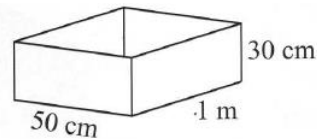


4 Find the capacity, in litres, of a rectangular tank with internal dimensions 60 cm by 20 cm by 1 m. [1 litre = 1000 cm^3]



A tray contains 200 ice cubes of side 2 cm. When ice melts its volume expands by 3%. Calculate the volume of water you will have when all the ice cubes melt.

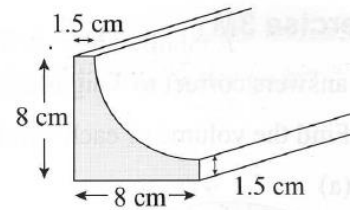
6 Liquid is poured into the can shown at a rate of 20 ml/sec. How long will it take to fill the can?



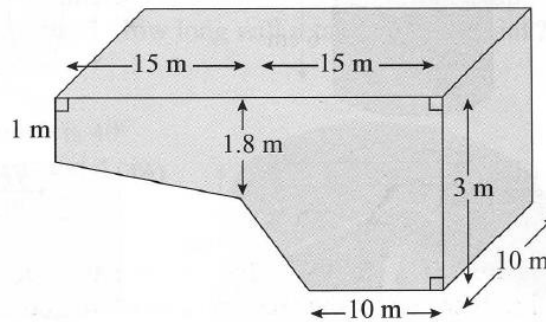
7 Two solid metal cuboids have dimensions, in cm, $2 \times 4 \times 10$ and $3 \times 3 \times 5$. The cuboids are melted down and formed into one large cube. Find the length of one side of the cube.

8 A cuboid has dimensions, in cm, $a \times b \times c$. The total volume of n of these cuboids is 3640 cm^3 . Find the value of n if $a = 5$, $b = 7$ and $c = b + 1$.

- 9 The cross section of a plaster moulding for ceilings is a quarter circle cut from a square. 1 cm^3 of the plaster weighs 1.2 g. Calculate the weight of a 4 m length of this moulding.



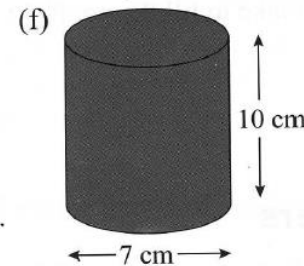
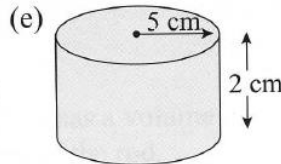
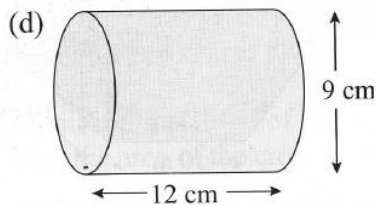
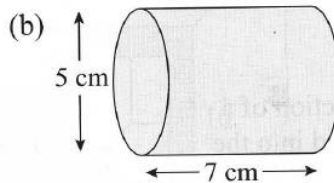
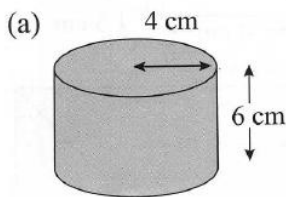
- 10 The diagram shows the cross section of a swimming pool. Water is pumped into the pool at a rate of 20 litres/sec. How long, in hours and minutes, will it take to fill the pool?



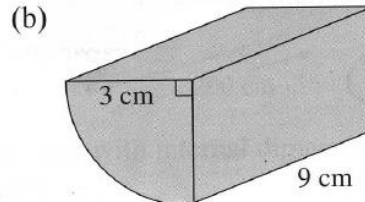
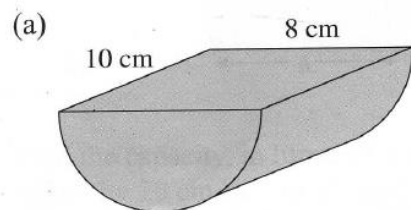
Exercise E

Give answers correct to 3 significant figures, where necessary.

- 1 Find the volume of each cylinder.



- 2 Cylinders are cut along the axis of symmetry. Find the volume of each object.



- 3 Find the volume in litres of a cylindrical tank of radius 40 cm and height 35 cm.

4

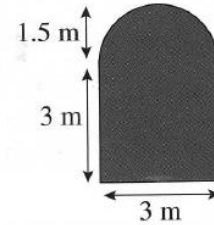


The diameter of a CD is 12 cm and the hole in the middle has diameter 1.6 cm. The thickness of the CD is 1.3 mm.

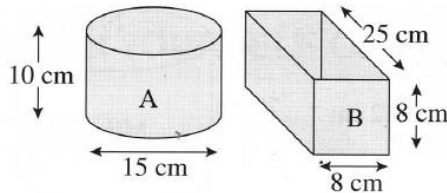
Calculate the volume of plastic in the CD.

- 5 The lead in an unsharpened pencil is in the shape of a cylinder of diameter 2 mm and length 16 cm. Find the volume of the lead in cm^3 .

- 6 A mine shaft 200 m long is dug with the cross-section shown. Calculate the volume of earth which must be removed to make way for the shaft.



7



Water is poured from the full cylinder A into the empty tank B. Will all the water go in?

- 8 An empty cylindrical tank of height 70 cm and diameter 1 metre is to be filled from a tap which delivers water at the rate of 150 ml per second. How long will it take to fill the tank? Give your answer to the nearest minute.

- 9 The sector angle of the red piece of this pie graph is 40° . The radius and thickness of the graph are 20 cm and 4 cm respectively. Calculate the volume of the red piece.

