

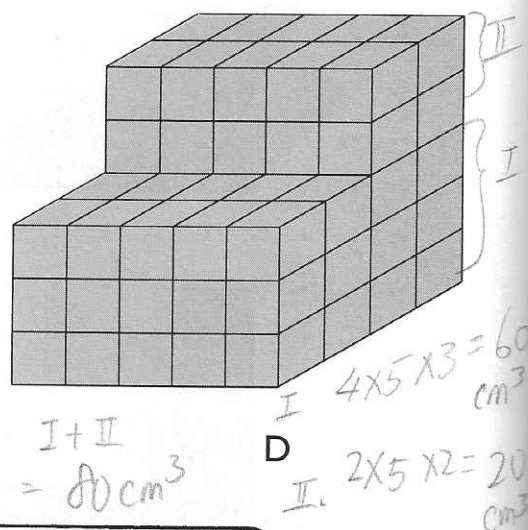
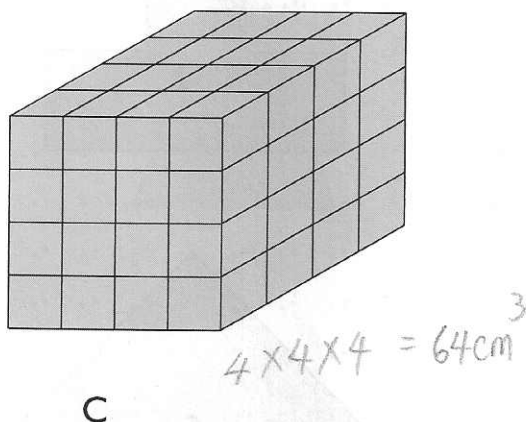
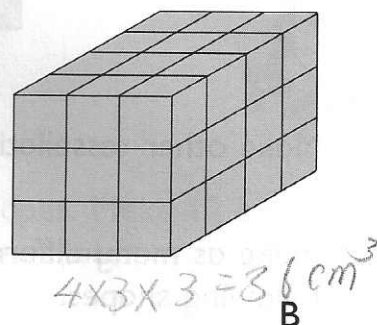
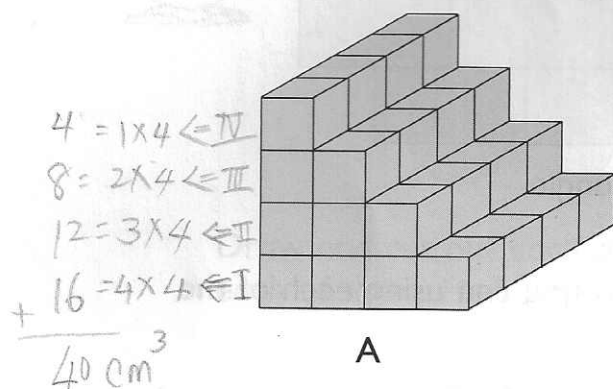
9 Volume

5/6 #/w: pp. 80-96 (all). check ans. in Homeworks section of school website

1 Cubes and Cuboids

The following solids are made up of 1-cm cubes. Find the volume of each solid.

volume of 1 cube = 1 cm^3



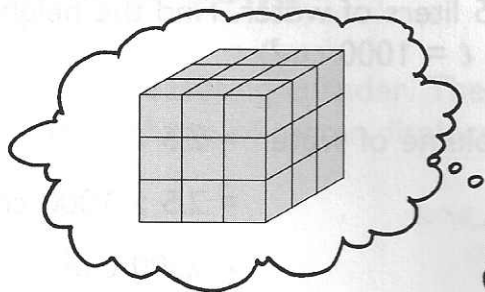
Which solid has the greatest volume?

D



1. The volume of a cube is 27 cm^3 . Find the length of one edge of the cube.

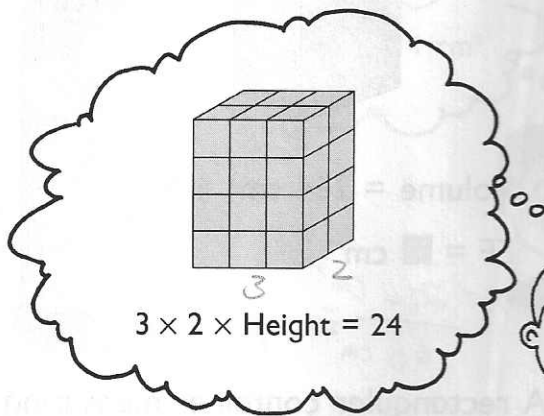
cm cm cm
 $3 \times 3 \times 3$
 $\blacksquare \times \blacksquare \times \blacksquare = 27 \text{ cm}^3$



The length of one edge of the cube is $\blacksquare \text{ cm}$.

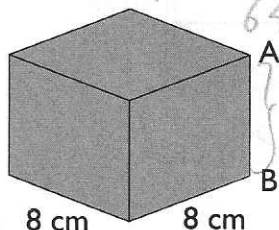
2. The volume of a cuboid is 24 cm^3 . The length of the cuboid is 3 cm and its width is 2 cm. Find its height.

Height = $\frac{24 \text{ cm}^3}{3 \times 2}$
 $= \blacksquare \text{ cm}$
 4



3. Find the unknown edge of each cuboid.

(a)

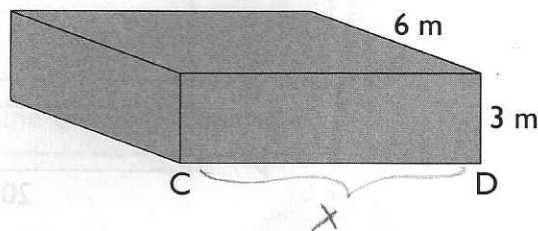


Volume = 576 cm^3

AB = $\blacksquare \text{ cm}$

9

(b)



Volume = 216 m^3

CD = $\blacksquare \text{ m}$

4. A rectangular container, 20 cm long and 10 cm wide, contains 2.5 liters of water. Find the height of the water level in the container. ($1 \ell = 1000 \text{ cm}^3$)

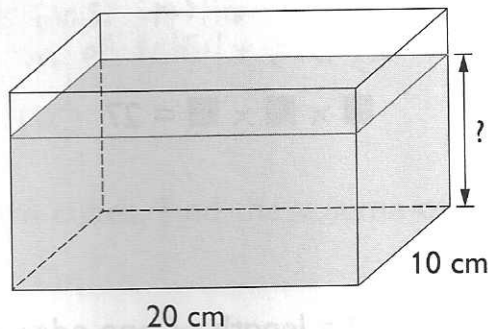
$$\text{Volume of water} = 2.5 \ell$$

$$= 2.5 \times 1000 \text{ cm}^3$$

$$= 2500 \text{ cm}^3$$

$$\text{Height of water level} = \frac{2500}{20 \times 10}$$

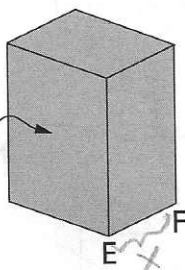
$$= \frac{2500 \text{ cm}^3}{200 \text{ cm}} = 12.5 \text{ cm}$$



5. Find the unknown edge of each cuboid.

(a)

$$\text{Area} = 66 \text{ cm}^2$$

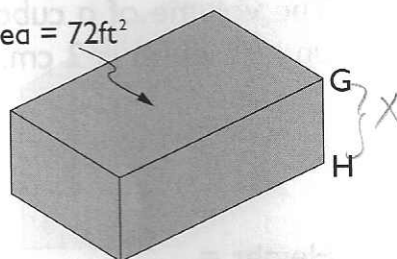


$$\text{Volume} = 264 \text{ cm}^3 = 66 \cdot X$$

$$EF = \blacksquare \text{ cm}$$

$$X = \frac{264 \text{ cm}^3}{66 \text{ cm}} = 4 \text{ cm}$$

(b) Area = 72 ft^2



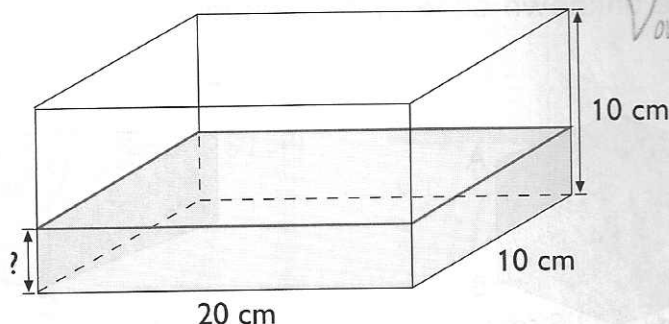
$$\text{Volume} = 288 \text{ ft}^3 = 72 \cdot X$$

$$GH = \blacksquare \text{ ft}$$

$$X = 4 \text{ ft}$$

Workbook Exercise 53

6. A rectangular container measuring 20 cm by 10 cm by 10 cm is filled with water to its brim. If 750 cm^3 of water is poured out from the container, what will be the height of the water level?



$$\text{Decrease in height of water level} = \frac{750 \text{ cm}^3}{20 \times 10} = \blacksquare \text{ cm}$$

$$\text{Height of water level} = \blacksquare \text{ cm}$$

$$10 - 3.75 = 6.25 \text{ cm}$$

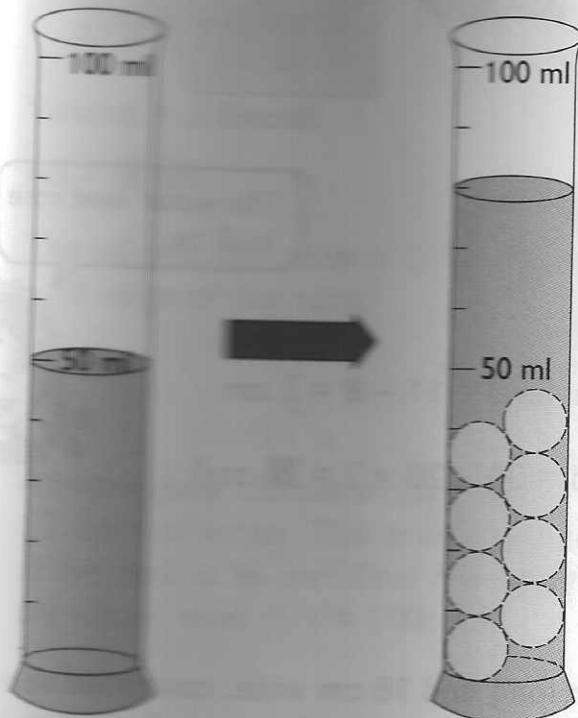
Workbook Exercise 54

2

Finding the Volume of a Solid

Samy poured 50 ml of water into a measuring cylinder. Then he put in some marbles and measured the volume of water displaced by the marbles.

same volume
as water



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



$$\text{Volume of water} = 50 \text{ cm}^3$$

80

$$\text{Volume of water and the marbles} = \blacksquare \text{ cm}^3$$

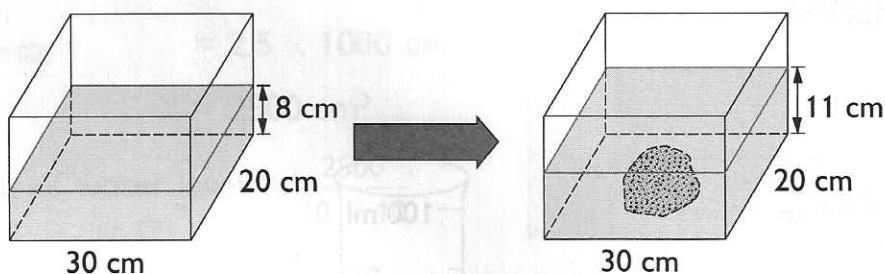
30

$$\text{Volume of the marbles} = \blacksquare \text{ cm}^3$$

$$\text{Volume of marbles} = \text{Volume of water displaced}$$



1. A rectangular tank, 30 cm long and 20 cm wide, is filled with water to a depth of 8 cm. When a stone was put in, the water level rose to 11 cm. Find the volume of the stone. (Assume that the stone is completely under water.)



The water level rose by 3 cm.

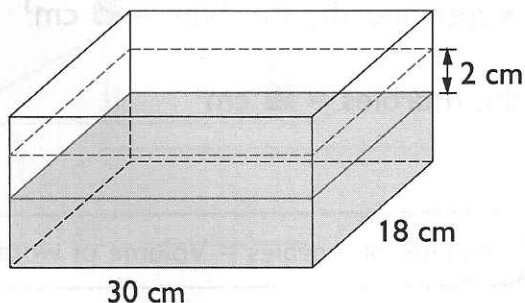


Increase in height of water level = $11 - 8 = 3$ cm

Volume of water displaced = $30 \times 20 \times 3 = 1800$ cm³

Volume of stone = 1800 cm³

2. A rectangular tank, 30 cm long and 18 cm wide, contained some water and a stone. When the stone was taken out, the water level dropped by 2 cm. Find the volume of the stone. (Assume that the stone was completely under water.)



Decrease in height of water level = 2 cm

Volume of stone = $30 \times 18 \times 2 = 1080$ cm³

PRACTICE 9A

1. Find the unknown edge of each cuboid.

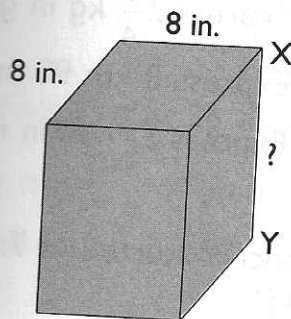
(a)



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

$$AB = \blacksquare \text{ cm}$$

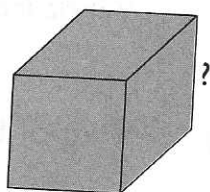
(b)



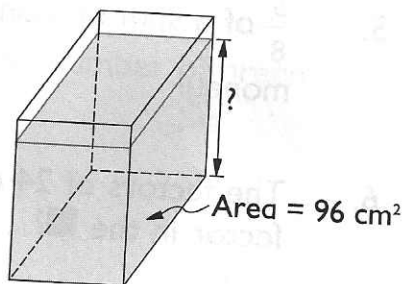
$$\text{Volume} = 576 \text{ in.}^3$$

$$XY = \blacksquare \text{ in.}$$

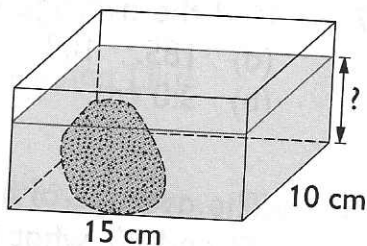
2. The volume of a cube is 125 in.^3 . Find the length of each edge of the cube.



3. A rectangular container contains 1.2 liters of water. The area of the base of the tank is 96 cm^2 . Find the height of the water level. ($1 \text{ L} = 1000 \text{ cm}^3$)



4. A rectangular container, 15 cm long and 10 cm wide, contains water to a depth of 4 cm. When a stone of volume 300 cm^3 is put in, the water level rises. Find the height of the new water level. (Assume that the stone is completely under water.)



5. A rectangular container, 9 cm long and 6 cm wide, was filled with water to a depth of 5 cm. When some marbles were added into the container, the depth of the water became 7 cm. Find the total volume of the marbles.

