Chapter 12: Volume of Cubes and Cubiods

12.1

Calculators can be used for all the questions in this topic.

Level 1

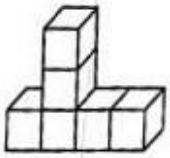
1. (a) 6 (b) 6
(c) 9 (d) 11

Exercise 1

1. How many cubes are used to build each solid?

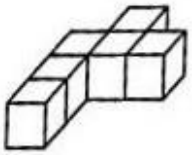
(a) Number of cubes used

= _____



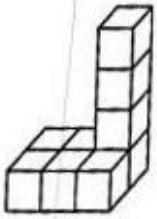
(b) Number of cubes used

= _____



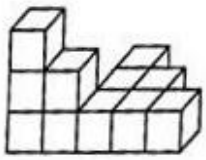
(c) Number of cubes used

= _____



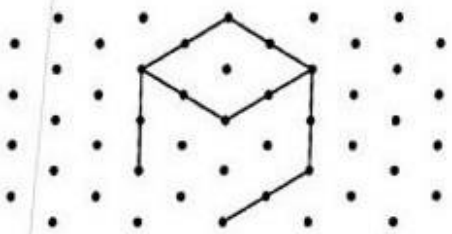
(d) Number of cubes used

= _____

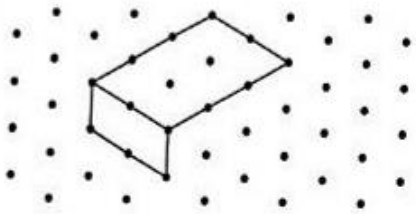


2. Complete the drawing of each cube or cuboid.

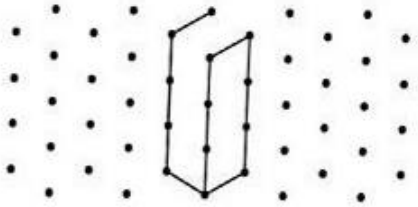
(a)



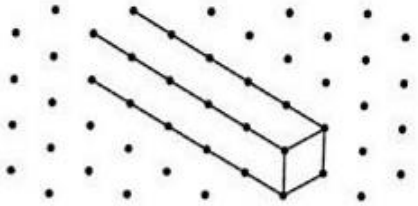
(b)



(c)



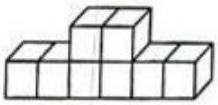
(d)



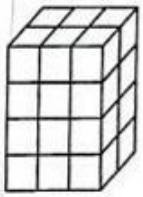
3. (a) 8 (b) 24
(c) 10 (d) 19

3. The solids below are made up of unit cubes. Find the volume of each solid.

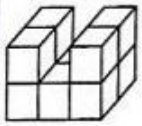
(a) Volume = _____ cubic units



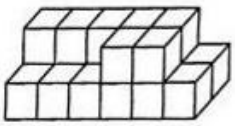
(b) Volume = _____ cubic units



(c) Volume = _____ cubic units



(d) Volume = _____ cubic units



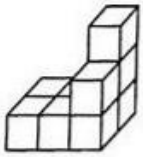
4. (a) 9 (b) 15

5.

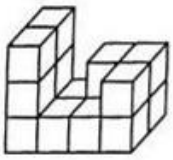
Solid	Length	Breadth	Height	Volume
A	3 cm	2 cm	3 cm	18 cm³
B	5 cm	3 cm	2 cm	30 cm³
C	5 cm	6 cm	1 cm	30 cm³
D	2 cm	2 cm	8 cm	32 cm³

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

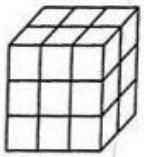
(a) Volume = _____ cm^3



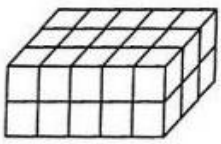
(b) Volume = _____ cm^3



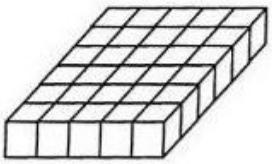
5. These solids are made up of 1-cm cubes.



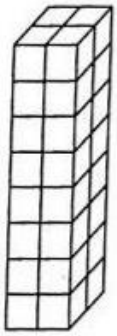
A



B



C



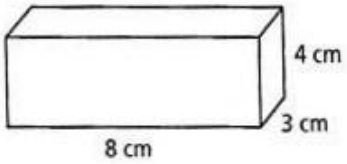
D

Complete the table below.

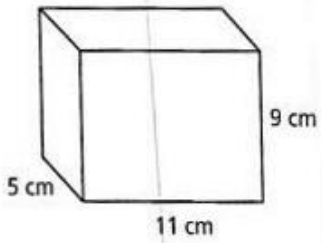
Solid	Length	Breadth	Height	Volume
A				
B				
C				
D				

6. Find the volume of each cuboid.

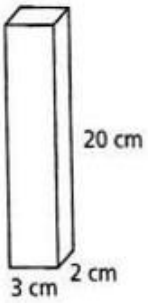
(a) Volume = _____ cm^3



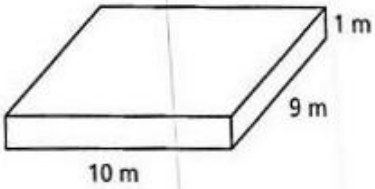
(b) Volume = _____ cm^3



(c) Volume = _____ cm^3

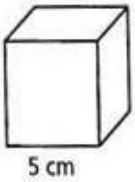


(d) Volume = _____ m^3

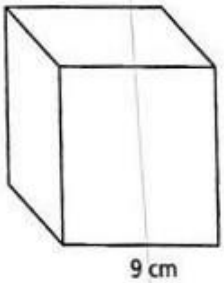


7. Find the volume of each cube.

(a) Volume = _____ m^3



(b) Volume = _____ cm^3



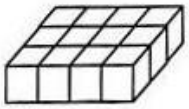
6. (a) 96 (b) 495
(c) 120 (d) 90

7. (a) 125 (b) 729

8. Find the volume of a cube of edge 40 cm long.

9. Find the volume of a cuboid of length 28 cm, breadth 20 cm and height 10 cm.

10. The volume of Cuboid X is 12 cm^3.
3 more layers are added to Cuboid X to make Cuboid Y.
The volume of Cuboid Y is _____ cm^3.



Cuboid X

8. 64 000 cm^3

9. 5600 cm^3

10. 48 cm^3

Exercise 2:

1. (a) 160 (b) 3000
   (c) 4010 (d) 18 005
2. (a) 0 l 250 ml (b) 1 l 705 ml
   (c) 3 l 10 ml (d) 15 l 9 ml

Exercise 2

1. Write in cubic centimetres.

   (a) 160 *ml* = _____ cm^3 (b) 3 *l* = _____ cm^3

   (c) 4 *l* 10 *ml* = _____ cm^3 (d) 18 *l* 5 *ml* = _____ cm^3

2. Write in litres and millilitres.

   (a) 250 cm^3 = _____ *l* _____ *ml*

   (b) 1705 cm^3 = _____ *l* _____ *ml*

   (c) 3010 cm^3 = _____ *l* _____ *ml*

   (d) 15 009 cm^3 = _____ *l* _____ *ml*

3. A rectangular container measures 50 cm by 20 cm by 9 cm. It is completely filled with water. How many cubic centimetres of water are there in the container?

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*4. A rectangular tank measures 19 cm by 14 cm by 15.5 cm. Find the capacity of the tank in litres and millilitres. (1 l = 1000 cm^3)

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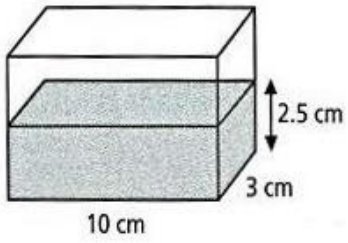
5. What is the volume of water in the container in cubic centimetres?



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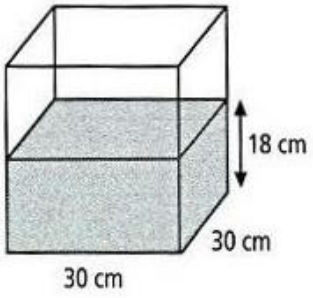
6. What is the volume of water in the container in litres and millilitres? (1 l = 1000 cm^3)



3. 9000 cm^3

4. 4$\int$ 123 m$\int$

5. 75 cm^3

6. 16$\int$ 200 m$\int$

7. A wooden rectangular block measures 8 cm by 6 cm by 4.5 cm. What is the total volume of 5 identical wooden blocks placed side by side? Give your answer in litres and millilitres. (1 l = 1000 cm^3)

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8. Find the total volume of 10 identical 7-cm cubes stacked one on top of the other. Give your answer in litres and millilitres. (1 l = 1000 cm^3)

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9. A cuboid measures 34 cm by 10 cm by 8 cm. Find the total volume of 4 identical cuboids. Give your answer in litres and millilitres. (1 l = 1000 cm^3)

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10. The base of a container is a square of side 20 cm. The height of the container is 15 cm. What is the capacity of the container in litres? (1 l = 1000 cm^3)

7. 1ʃ 80 mʃ

8. 3ʃ 430 mʃ

9. 10ʃ 880 mʃ

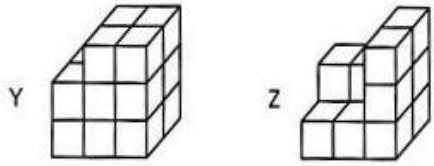
10. 6ʃ

Level 2

12.2

Exercise 1

1. How many cubes must be removed from Solid Y so that it becomes Solid Z?



(1) 4
(2) 5
(3) 6
(4) 10

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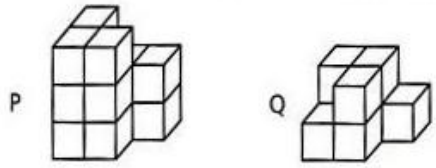
2. How many cubes must be removed from Solid P so that it becomes Solid Q?



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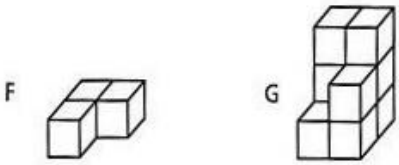
3. How many cubes must be added to Solid F so that it becomes Solid G?



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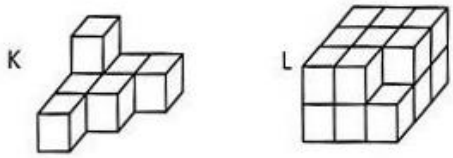
4. How many cubes must be added to Solid K so that it becomes Solid L?



*5. A rectangular container measuring 52 cm by 45 cm by 33 cm is filled with water to the brim. Then, 10.07 *l* of water are taken out of the container. How much water is left in the container? Give your answer in litres and millilitres. (1 *l* = 1000 cm³)

(5) 67∫ 150 m∫

(6) 6∫ 450 m∫

(7) 320∫ 625 m∫

*6. A container with a square base of side 25 cm and a height of 20 cm was filled with water to the brim. Some water was poured out of the container and 6.05 *l* of water were left. How much water was poured out? Give your answer in litres and millilitres. (1 *l* = 1000 cm³)

*7. A rectangular fish tank measures 95 cm by 60 cm by 75 cm. It is filled with water up to $\frac{3}{4}$ of its height. What is the volume of water in the fish tank? Give your answer in litres and millilitres. (1 *l* = 1000 cm³)

*8. A cubical tank with an edge of 36 cm is $\frac{5}{6}$ filled with water. How much water is there in the tank? Give your answer in litres and millilitres.
($1\ l = 1000\ cm^3$)

(8) 38ʃ 880 mʃ

(9) (a) 81ʃ
(b) 189ʃ

(10) 5ʃ 292 mʃ

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*9. A container 100 cm long, 45 cm wide and 60 cm high is $\frac{3}{10}$ filled with used cooking oil from a restaurant.
(a) Find the volume of used cooking oil in the container.
(b) How much more used cooking oil can be poured into the container before it becomes full?
Give both answers in litres. ($1\ l = 1000\ cm^3$)

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*10. A cubical container of edge 21 cm is filled with washing powder up to $\frac{3}{7}$ of its height. How much more washing powder can be poured into the container before it becomes full? Give your answer in litres and millilitres.
($1\ l = 1000\ cm^3$)

Exercise 2

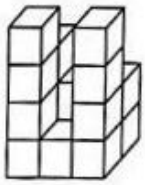
Choose the correct answer and write its number in the brackets provided.

1. The capacity of Kim's water bottle is 500 _____.
   (1) l (2) m^3
   (3) cm^3 (4) cm^2 ( )

2. How many cubes are used to build the solid below?

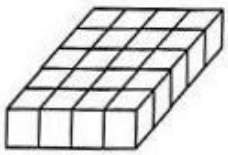
   (1) 7 (2) 8
   (3) 9 (4) 10 ( )

3. The solid below is made up of 1-cm cubes. Find the volume of the solid.



   (1) 13 cm^3 (2) 14 cm^3
   (3) 15 cm^3 (4) 16 cm^3 ( )

4. The volume of Cuboid A is 20 cm^3.
   2 more layers are added to Cuboid A to make Cuboid B.
   The volume of Cuboid B is _____ cm^3.



Cuboid A

   (1) 60 (2) 40
   (3) 24 (4) 22 ( )

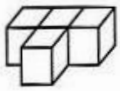
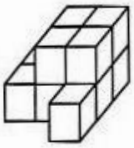
5. A rectangular container measures 5 cm by 4 cm by 20 cm. It is filled with liquid detergent up to $\frac{9}{10}$ of its height. Find the volume of detergent in the container.
   (1) 400 cm^3 (2) 360 cm^3
   (3) 340 cm^3 (4) 320 cm^3 ( )

(1) 3
(2) 4
(3) 4
(4) 1
(5) 2

6. A container with a square base of side 27 cm and a height of 9 cm is filled with water to the brim. Find the volume of water in the container.
(1) 243 cm^3 (2) 729 cm^3
(3) 2187 cm^3 (4) 6561 cm^3 ( )

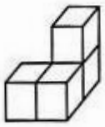
7. A rectangular tank 60 cm long, 40 cm wide and 25 cm high is 60% filled with water. How much more water can be added to the tank before it is full?
(1) 24 *l* (2) 25 *l*
(3) 36 *l* (4) 60 *l* ( )

8. How many cubes must be added to Solid A so that it becomes Solid B?

A  B 

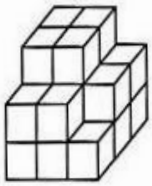
(1) 6 (2) 7
(3) 8 (4) 9 ( )

9. How many more unit cubes must be added to the figure to form a cube?



(1) 7 (2) 6
(3) 5 (4) 4 ( )

10. How many more unit cubes must be added to the figure to form a cube?



(1) 7 (2) 6
(3) 5 (4) 4 ( )

(6) 4
(7) 1
(8) 2
(9) 4
(10) 2

Level 3

12.3

Exercise 1

1. Water from a tap flows into an empty tank at 4.25 litres a minute. How much water is there in the tank after 9 minutes? Give your answer in litres and millilitres.

(1) 38ʃ 250 mʃ

(2) 6ʃ

(3) 300 mʃ

2. Water is being pumped out of a tank at 750 m*l* a minute. How much water is pumped out after 8 minutes? Give your answer in litres.

*3. A cubical tank of edge 10 cm is half filled with water. Then, water is poured into the tank until it is $\frac{4}{5}$ full. How much water has been poured into the tank? Give your answer in millilitres. (1 m*l* = 1 cm^3)

*4. A rectangular tank has a length of 18 cm and a width of 13 cm. Its height is 15 cm. It is filled with water to the brim. Then, some of the water is poured into a cubical tank of edge 8 cm till the cubical tank is completely full. How much water is left in the rectangular tank? Give your answer in litres and millilitres. (1 l = 1000 cm³)

(4) 2998 cm³

(5) 4∫ 560 m∫

(6) 7∫ 587 m∫

*5. A cubical tank of edge 16 cm is filled with water up to $\frac{5}{8}$ of its height. Water from a tap flows into the tank at 1 litre a minute. How much water is in the tank after 2 minutes? Give your answer in litres and millilitres. (1 l = 1000 cm³)

*6. A cubical tank of edge 21 cm is filled with water up to $\frac{1}{3}$ of its height. Water from a tap flows into the tank at 1.5 litres a minute. How much water is in the tank after 3 minutes? Give your answer in litres and millilitres. (1 l = 1000 cm³)

*7. At first, a cubical tank of edge 18 cm is filled with water up to $\frac{1}{6}$ of its height. Then, some water is poured into it until the water is up to $\frac{5}{8}$ of its height. How much water is poured into the tank? Give your answer in litres and millilitres. (1 l = 1000 cm^3)

(7) 2∫ 673 m∫

(8) 5184 m∫

(9) (a) 9 : 10
(b) 6000 cm^3

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*8. A cubical tank has an edge of 24 cm. The ratio of the volume of water in the tank to the capacity of the tank is 3 : 8. Find the volume of water in the tank. Give your answer in millilitres.

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9. A rectangular fish tank is 90% filled with water.
   (a) What is the ratio of the volume of water in the tank to the capacity of the tank?
   (b) If there is 5400 cm^3 of water in the tank now, what is the capacity of the tank?

10. A rectangular fish tank is 80% filled with water.
    (a) What is the ratio of the volume of water in the tank to the volume of water that can still be added before the tank becomes full?
    (b) If the capacity of the tank is 5000 cm^3, how much more water can still be added to the tank before it becomes full?

(10) (a) 4 : 1
(b) 1000 cm^3

Exercise 2:

(1) 44∫ 800 m∫

(2) $\frac{17}{18}$

Exercise 2

*1. A rectangular tank measures 55 cm by 40 cm by 36 cm. It is filled with water up to $\frac{2}{3}$ of its height. Then, some of the water is poured into a smaller cubical tank of edge 20 cm to fill it to its brim. Find the volume of water left in the rectangular tank. Give your answer in litres and millilitres.
($1\ l = 1000\ cm^3$)

*2. A cubical container of edge 30 cm is filled with water to the brim. Then, some of the water is poured into a rectangular tank measuring 15 cm by 10 cm by 10 cm to fill it to its brim. What fraction of the water is left?

3. A cubical container of edge 20 cm is filled with water to the brim. Then, some of the water is discharged from a tap at 1.2 litres a minute. What fraction of the water is left after 5 minutes?

(3) $\frac{1}{4}$

(4) 3 : 1

(5) 75%

*4. A rectangular tank 65 cm long, 50 cm wide and 32 cm high is filled with petrol to the brim. Some of the petrol is used and in the end, 26 *l* of petrol are left. Find the ratio of the volume of petrol used to the volume of petrol left.

5. A cubical tank of edge 40 cm is filled with water to the brim. Water is being pumped out at 4 litres a minute. Find the percentage of water that is left after 4 minutes.

*6. A cubical tank of edge 50 cm is filled with water to the brim. Water is pumped out at 15 litres a minute. How long will it take to pump out all the water? Give your answer in minutes and seconds.

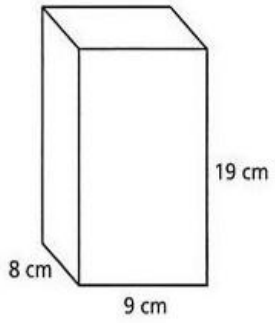
(6) 8 min 20 s

(7) 12 min

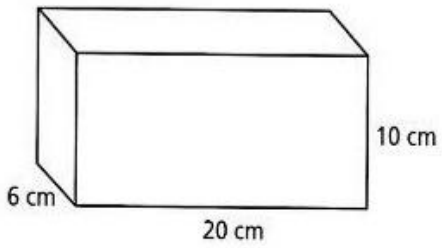
(8) 16

7. A rectangular tank with a square base of side 60 cm and a height of 40 cm is half filled with water. Water is flowing into the tank at 6 litres a minute. How long will it take to fill the tank completely? Give your answer in minutes.

8. What is the most number of 4-cm cubes that can be placed inside the container below?



9. What is the most number of 3-cm cubes that can be placed inside the container below?



(9) 36

(10) 27

10. What is the most number of 2-cm cubes that can be placed inside the container below?