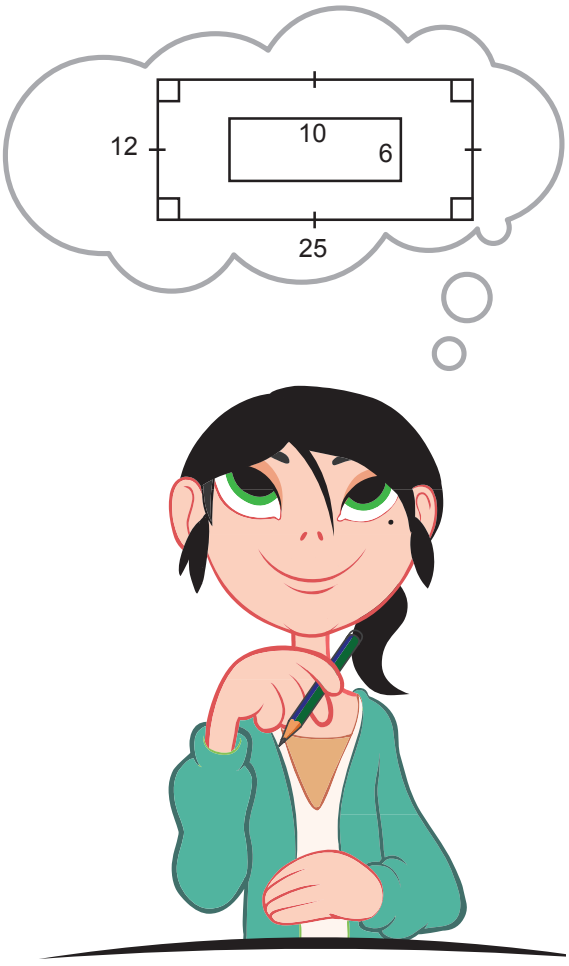
MATHLETICS

Area, Volume and Capacity

Student Book - Series H-1



Mathletics Instant Workbooks

Area, volume and capacity

Student Book - Series H

Contents

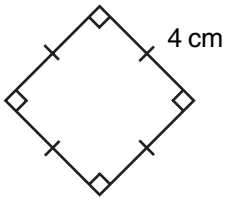
Author of The Topics and Topic Tests: AS Kalra

Area, volume and capacity

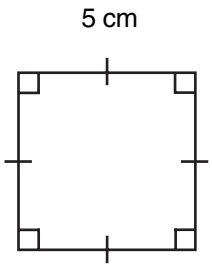
Topic 1: Area of a square

QUESTION 1 Find the area of the following squares.

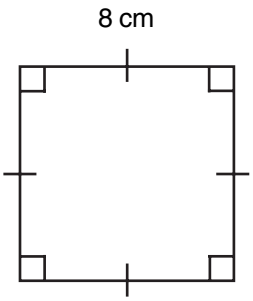
a



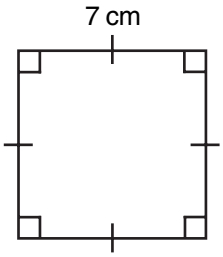
b



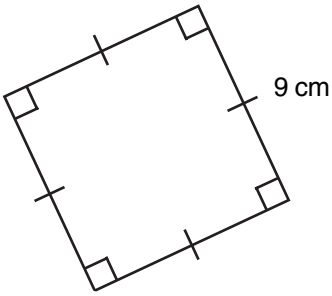
c



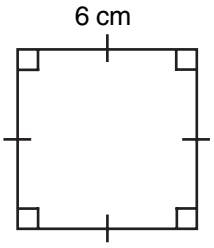
d



e



f



QUESTION 2 Find the area of the square whose side is given below. (Show all your working.)

a 3 m

b 10 m

c 11 cm

d 1.5 m

e 12 mm

f 3.2 m

QUESTION 3 Find the length of the side of the square whose area is given below. (Show all working.)

a 16 cm^2

b 169 m^2

c 49 m^2

d 225 cm^2

e 256 cm^2

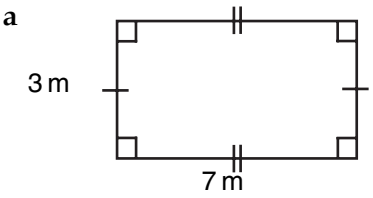
f 676 mm^2

Area, volume and capacity

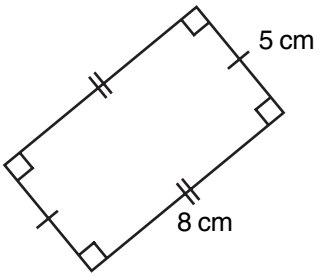
Topic 2: Area of a rectangle

QUESTION 1 Find the area of the following rectangles.

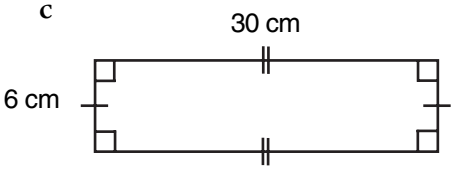
a



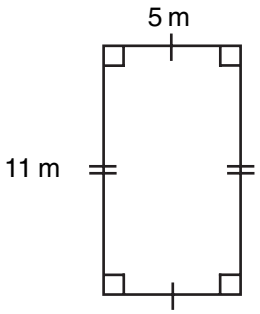
b



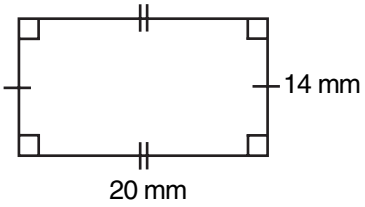
c



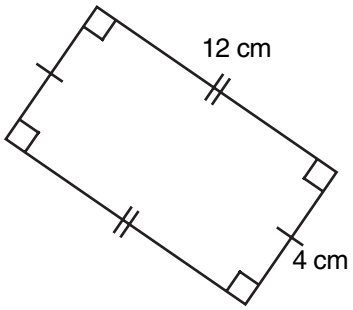
d



e



f



QUESTION 2 Find the area of each of the following rectangles whose length and breadth are given.

	Length	Breadth	Area
a	9 cm	7 cm	
b	12 cm	3 cm	
c	14 m	5 m	
d	11 mm	6 mm	
e	8 m	3 m	

	Length	Breadth	Area
f	10 m	6 m	
g	15 cm	8 cm	
h	25 mm	6 mm	
i	20 cm	7 cm	
j	16 cm	10 cm	

QUESTION 3 Complete the following.

	Length	Breadth	Area
a	6 m	5 m	
b	8 cm		32 cm^2
c	18 cm	4 cm	
d	12 cm		84 cm^2
e	21 m		105 m^2

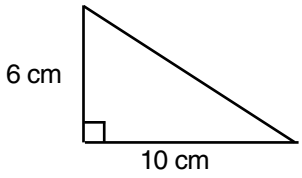
	Length	Breadth	Area
f	13 m		65 m^2
g	14 cm	8 cm	
h		9 cm	99 cm^2
i	28 mm		140 mm^2
j		20 cm	700 cm^2

Area, volume and capacity

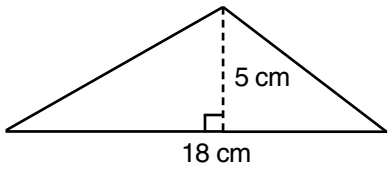
Topic 3: Area of a triangle

QUESTION 1 Find the area of the following triangles.

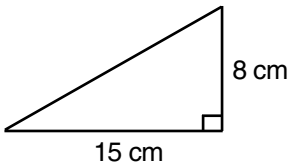
a



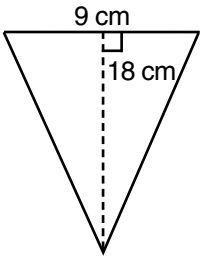
b



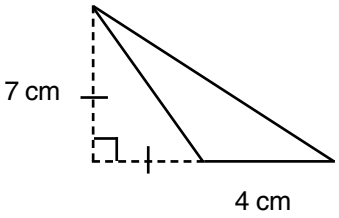
c



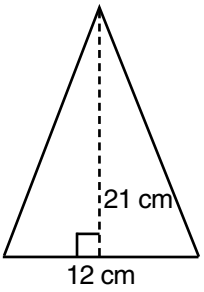
d



e



f



QUESTION 2

a A triangle has a base of 30 cm and a height of 15 cm. What is its area?

_____

b A triangle has an area of 112 cm^2 and a base length of 28 cm. Find its height.

_____

QUESTION 3 Find the area of the triangles whose base and height are given.

	Base	Height	Area
a	6 m	4 m	
b	11 cm	6 cm	
c	10 cm	8 cm	

	Base	Height	Area
d	18 cm	6 cm	
e	9 cm	8 cm	
f	7 m	6 m	

QUESTION 4 Complete the following. (All lengths are in cm; areas are in cm^2.)

	Base	Height	Area of triangle
a	16	4	
b	9		36
c	14	6	

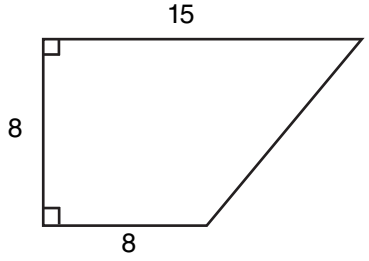
	Base	Height	Area of triangle
d		11	44
e	20	10	
f		13	65

Area, volume and capacity

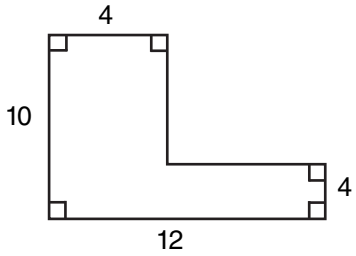
Topic 4: Composite areas

QUESTION 1 Find the areas of the following composite figures by dividing them into rectangles, squares and triangles. All measurements are in centimetres.

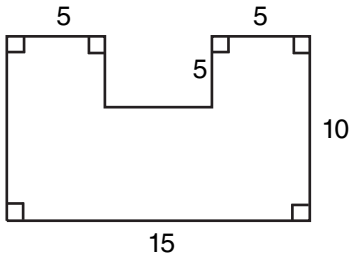
a



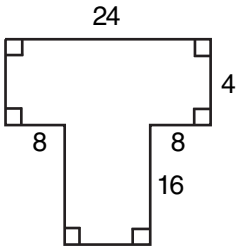
b



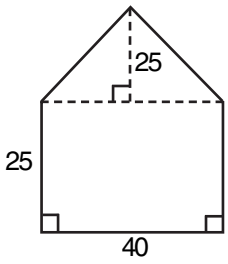
c



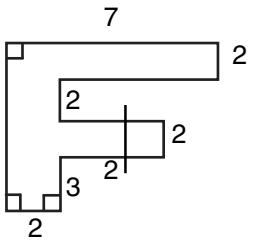
d



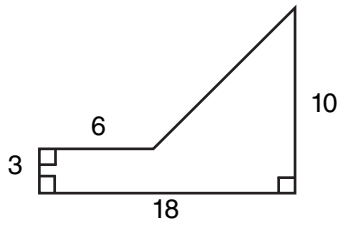
e



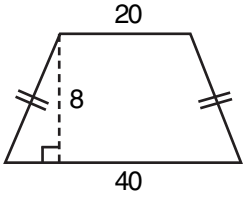
f



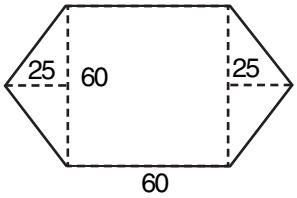
g



h

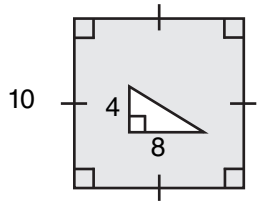


i

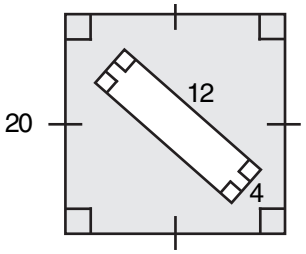


QUESTION 2 Find the shaded area of each shape. All measurements are in centimetres.

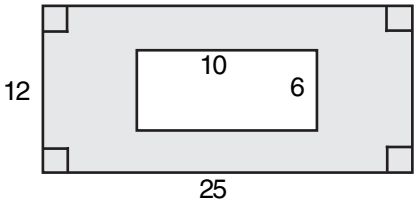
a

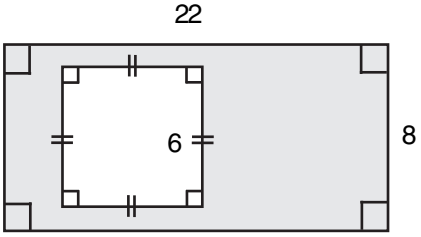


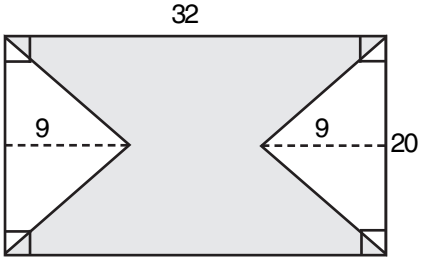
b

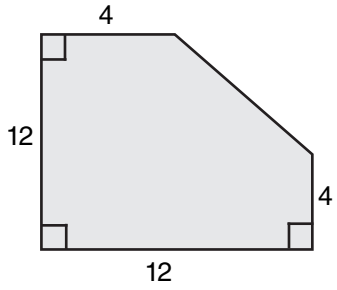


c





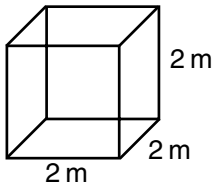


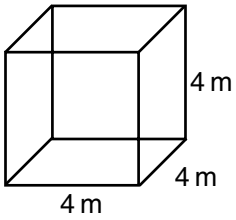


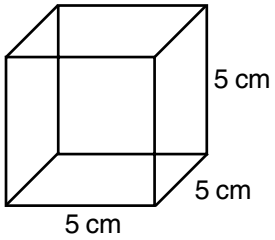
Area, volume and capacity

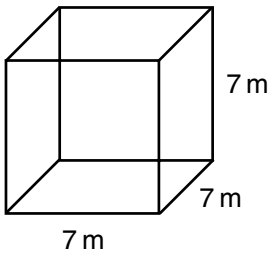
Topic 5: Volume of a cube

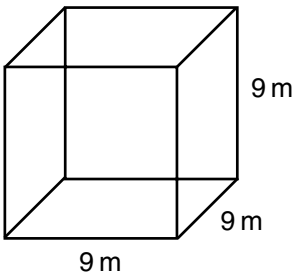
QUESTION **1** Find the volume of the following cubes.

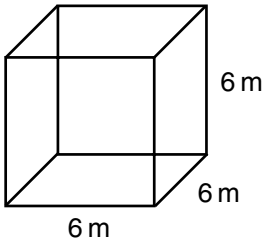












QUESTION **2**

a The volume of a cube is 125 cm^3. What is the length of each edge? _____

b The volume of a cube is 343 cm^3. Find its side length. _____

QUESTION **3** Calculate the volume of each of the following cubes whose side length is given. Show all your working.

a 1 cm

_____

_____

b 11 cm

_____

_____

c 10 cm

_____

_____

d 2.4 m

_____

_____

e 3 m

_____

_____

f 1.6 m

_____

_____

g 8 cm

_____

_____

h 1.9 m

_____

_____

i 2.5 m

_____

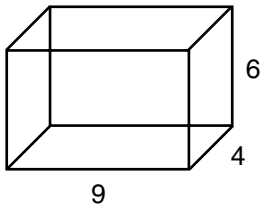
_____

Area, volume and capacity

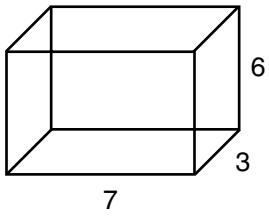
Topic 6: Volume of a rectangular prism

QUESTION 1 Find the volume of the following rectangular prisms. All measurements are in centimetres.

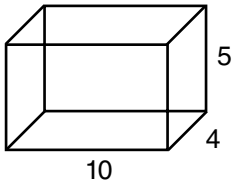
a



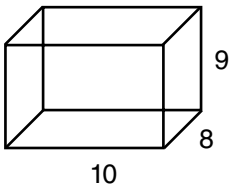
b



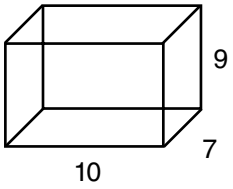
c



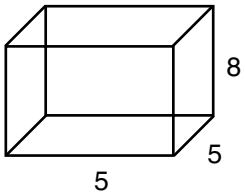
d



e



f



QUESTION 2 Find the volume of each of the following rectangular prisms whose dimensions are given below.

	Length	Breadth	Height	Volume
a	10 cm	5 cm	7 cm	
b	8 m	4 m	6 m	
c	9 mm	5 mm	2 mm	

	Length	Breadth	Height	Volume
d	9 cm	2 cm	3 cm	
e	11 cm	4 cm	5 cm	
f	8 m	3 m	2 m	

QUESTION 3 Complete the following.

	Length	Breadth	Height	Volume
a	6 m	4 m	3 m	
b	7 cm	5 cm	3 cm	
c	6 mm	7 mm		84 mm^3

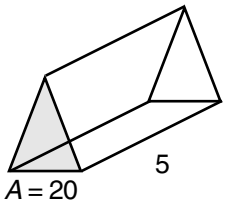
	Length	Breadth	Height	Volume
d		6 cm	4 cm	216 cm^3
e	9 m		7 m	252 m^3
f	5 cm	4 cm	3 cm	

Area, volume and capacity

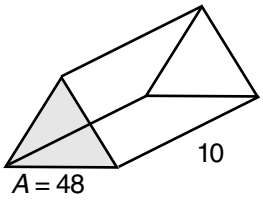
Topic 7: Volume of a triangular prism

QUESTION 1 Find the volume of the following triangular prisms. All lengths are in centimetres, areas in square centimetres.

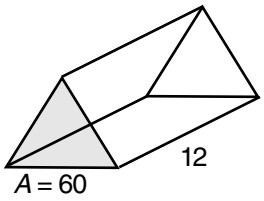
a



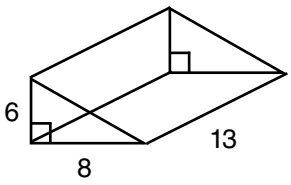
b



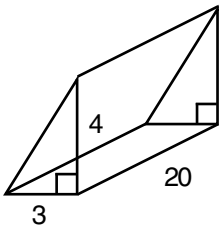
c



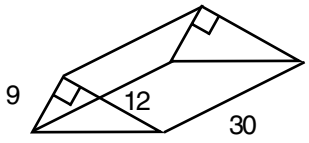
d



e



f



QUESTION 2 Find the volume of each of the following triangular prisms whose dimensions are given below.

	Base area	Height	Volume
a	30 cm²	8 cm	
b	20 m²	9 m	
c	82 cm²	15 cm	

	Base area	Height	Volume
d	84 cm²	20 cm	
e	15 m²	4 m	
f	40 m²	12 m	

QUESTION 3 Complete the following.

	Base area	Height	Volume
a	24 m²	5 m	
b		9 cm	477 cm³
c	36 m²	10 m	
d	41 m²		492 m³

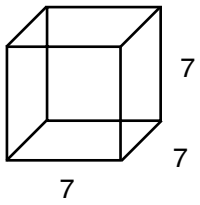
	Base area	Height	Volume
e		8 cm	536 cm³
f	18 cm²		162 cm³
g	72 m²	5 m	
h	58 m²	6 m	

Area, volume and capacity

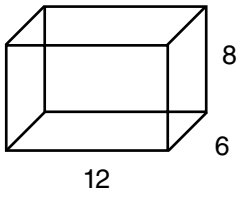
Topic 8: Volume of prisms — miscellaneous

QUESTION 1 Find the volume of the following prisms. Length are in cm, areas in cm^2.

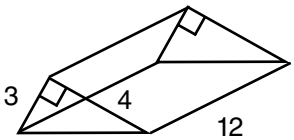
a



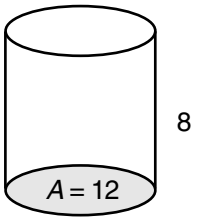
b



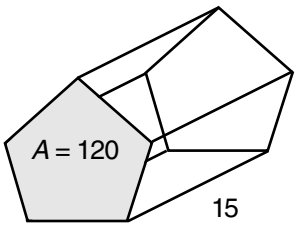
c



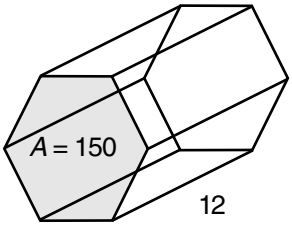
d



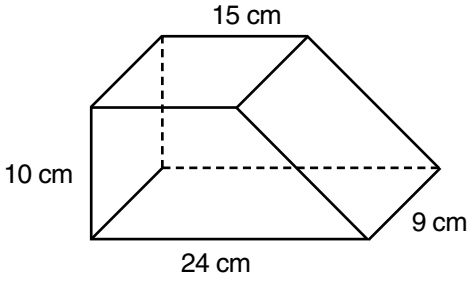
e



f



QUESTION 2 For the given solid:



a find the number of faces _____

b find the number of vertices _____

c find the number of edges _____

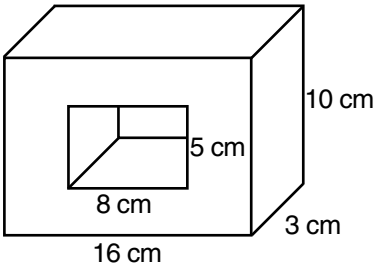
d draw a line to divide it into a rectangular prism and a triangular prism

e find the volume of the rectangular prism _____

f find the volume of the triangular prism _____

g find the total volume of the solid _____

QUESTION 3 For the given solid:



a find the area of the front big rectangle _____

b find the area of the front small rectangle _____

c find the cross-sectional area _____

d find the volume of the solid _____

Area, volume and capacity

Topic 9: Capacity and volume

Question 1 Convert the following to the unit given.

a 1000 mL = _____ L **b** 75 000 mL = _____ L **c** 3500 mL = _____ L

d 6 L = _____ mL **e** 3.25 L = _____ mL **f** 6.5 L = _____ mL

g 1 kL = _____ L **h** 4 kL = _____ L **i** 6.5 kL = _____ L

Question 2 Convert each of the following to the unit given.

a 1000 mm^3 = _____ cm^3 **b** 1 000 000 cm^3 = _____ m^3 **c** 1 mL = _____ cm^3

d 1000 cm^3 = _____ L **e** 1000 L = _____ kL **f** 1 kL = _____ m^3

Question 3

a A jug has a volume of 12 000 cm^3. How many litres of water can it hold?

_____

b A swimming pool holds 25 000 L of water. How many kilolitres is this?

_____

c A bottle contains $\frac{3}{5}$ of a litre of drink. How many millilitres is this?

_____

d A fish tank measures 80 cm × 60 cm × 15 cm.

i Find its volume in cubic centimetres.

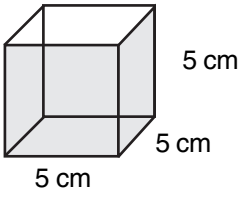
_____

ii How many litres of water will it hold?

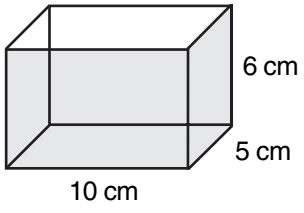
_____

Question 4 Find the volume of the following prisms and then find how many mL of liquid each would hold. Show working.

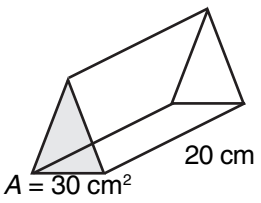
a



b



c



Area, volume and capacity

Topic 10: Problem solving with area, volume and capacity

1 A rectangular tank with dimensions 80 cm × 20 cm × 25 cm is filled with water. Hold many litres of water will it hold?

2 A dripping tap loses 5 mL of water every 30 seconds. How much water will be lost in 1 hour?

3 The volume of a cube is 729 cm^3. Find its side length.

4 Dilnoor drank $\frac{4}{5}$ of a litre of milk. How many millilitres is this?

5 Three hundred children went on a picnic. Each child drank a can of drink containing 500 mL. How many litres were consumed altogether?

6 A rectangular prism has dimensions 3 cm by 5 cm by 6 cm.

i What is its volume?

ii If each of these dimensions are doubled, what would be its volume?

7 A photograph is 40 cm long and 20 cm wide. Find its area.

8 The perimeter of a square is 40 cm. Find the area of the square.

9 A triangle has an area of 80 cm^2. If the base of the triangle is 20 cm, find its height.

10 Find the total area of the four walls of a room 10 m long, 8 m wide and 3 m high.

11 One of the faces of a cube has an area of 36 cm^2. What is the volume of the cube?

12 Kabir drank 1.25 litres of milk. How many millilitres is this?

Area, volume and capacity

Unit Test — PART A

Instructions This part consists of 12 multiple-choice questions
Each question is worth 1 mark
Fill in only ONE CIRCLE for each question
Calculators are NOT allowed

Time allowed: 15 minutes **Total marks = 12**

Marks

1 What is the cost of tiling a floor 9 m by 3 m at $20 per square metre?
(A) $450 (B) $504 (C) $540 (D) $527 [1]

2 How many tiles each measuring 10 cm × 10 cm are needed to cover a floor 6 m × 6 m?
(A) 3600 (B) 60 000 (C) 30 000 (D) 36 [1]

3 A petrol tank when half full holds 40 litres. How much more petrol does it hold if it is three-quarters full?
(A) 15 mL (B) 25 mL (C) 18 L (D) 20 L [1]

4 The area of a square of size 11 cm is
(A) 11 cm^2 (B) 121 cm^2 (C) 110 cm^2 (D) 44 cm^2 [1]

5 A rectangle is 18 m long and 7 m wide. Its area equals
(A) 50 m^2 (B) 49 m^2 (C) 126 m^2 (D) 324 m^2 [1]

6 If the volume of cube is 64 cm^3, then its side length is
(A) 8 cm (B) 4 cm (C) 2 cm (D) 16 cm [1]

7 How many mm^2 in 3 cm^2?
(A) 3 mm^2 (B) 30 mm^2 (C) 300 mm^2 (D) 3000 mm^2 [1]

8 How many mL in 3.5 L?
(A) 35 mL (B) 350 mL (C) 3500 mL (D) 35 000 mL [1]

9 How many kL in 4 m^3?
(A) 4 kL (B) 40 kL (C) 400 kL (D) 4000 kL [1]

10 How many cm^3 in 2 m^3?
(A) 2000 cm^3 (B) 20 000 cm^3 (C) 200 000 cm^3 (D) 2 000 000 cm^3 [1]

11 The volume of a rectangular prism 4 cm × 5 cm × 6 cm equals
(A) 15 cm^3 (B) 30 cm^3 (C) 60 cm^3 (D) 120 cm^3 [1]

12 The capacity of a glass would be closest to
(A) 30 mL (B) 300 mL (C) 3000 mL (D) 3500 mL [1]

Total marks achieved for PART A /12

Area, volume and capacity

Unit Test — PART B

Instructions This part consists of 15 questions
Each question is worth 1 mark
Write answers in the answers-only column

Time allowed: 20 minutes **Total marks = 15**

	Questions	Answers only	Marks
1	Find the volume of a cube of edge 8 cm.	_____	1
2	Find the volume of a rectangular prism 6 cm × 9 cm × 3 cm.	_____	1
3	Find the volume of a triangular prism with base area 30 cm^2 and height 10 cm.	_____	1
4	How many litres in 5000 mL?	_____	1
5	The volume of a cube is 1331 cm^3. Find its edge length.	_____	1
6	A rectangular prism has dimensions 2 cm by 3 cm by 4 cm. Find its volume.	_____	1
7	If each of the dimensions given in question 6 is doubled, what would be the prism's volume?	_____	1
8	Find the area of a rectangle 10 m × 6 m.	_____	1
9	Find the side length of a square whose area is 169 cm^2.	_____	1
10	If the area of a triangle is 30 cm^2 and its base is 6 cm, find the height of the triangle.	_____	1
11	There are 28 students in a class. Each student drinks 250 mL of milk. How many litres is this?	_____	1
12	Find the area of a triangle with a base of 29 mm and a height of 40 mm.	_____	1
13	Find the number of cubic millimetres (mm^3) in one cubic centimetre.	_____	1
14	How many millilitres are in 1 kilolitre?	_____	1
15	A jug has a volume of 8000 cm^3. How many litres of water can it hold?	_____	1

Total marks achieved for PART B ____/15