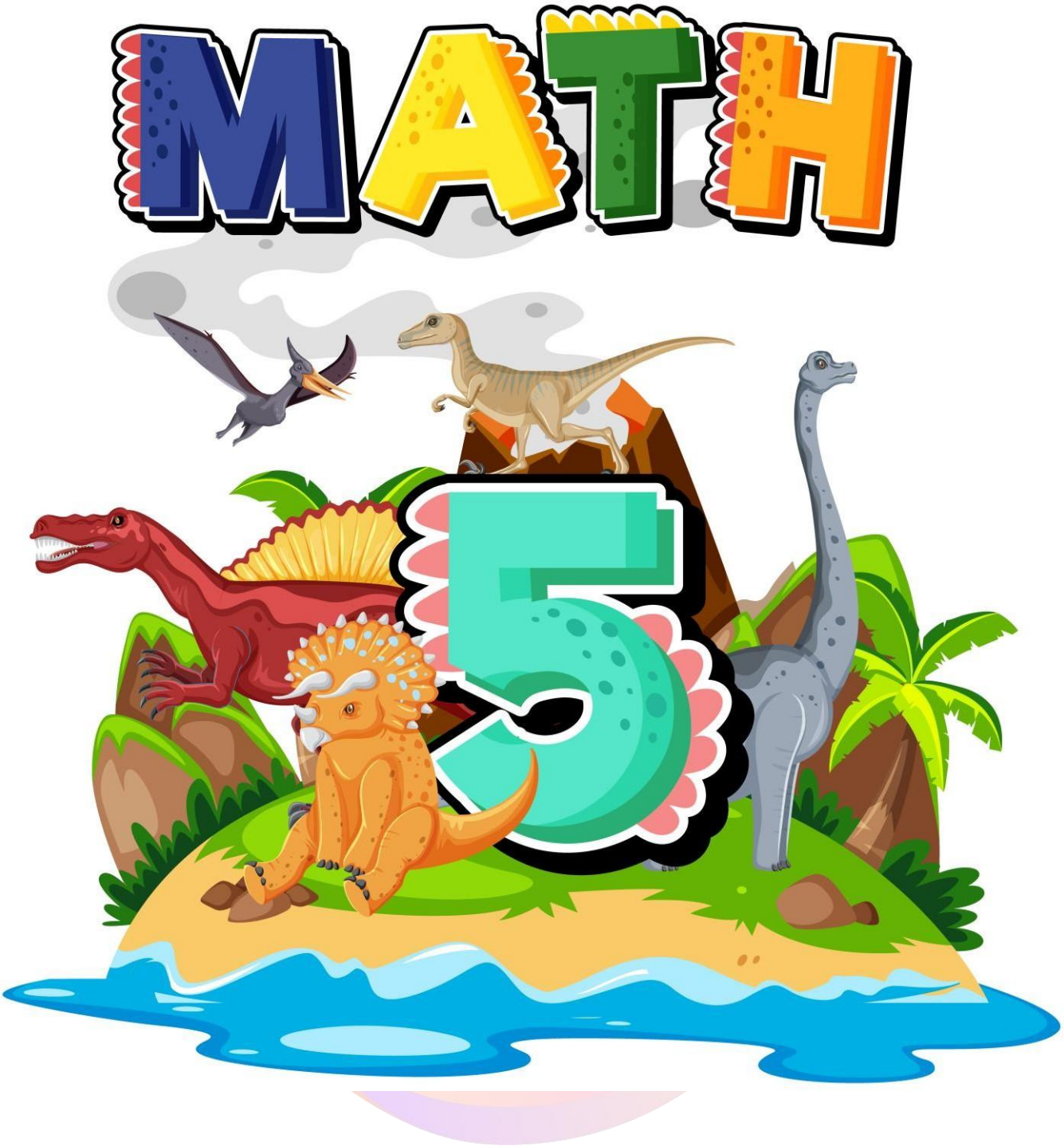


CHAPTER 11: MENSURATION

MENSURATION

➢ MENSURATION

Perimeter:

The total boundary length of a closed figure is called its perimeter. It is expressed in usual units of measurement of length.

Area

The amount of surface enclosed by a closed figure is called its area.

(a) Area is measured in square units.

(b) 1 m = 100 cm; 1 sq. m = 10000 sq. cm;

(c) 1 cm = 10 mm; 1 sq. cm = 100 sq. mm

Volume

The space occupied by an object is called its volume.

(a) Volume is measured in cubic units.

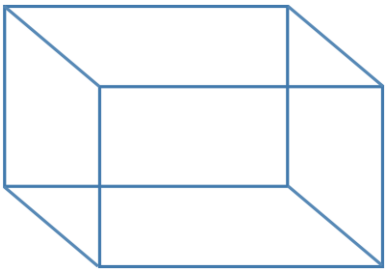
(b) 1 cu m = 1000000 cu cm;

(c) 1 cu cm = 1000 cu mm

Cube:

- It is a solid figure with 6 square surfaces.
- Volume of a cube = edge x edge x edge cu units.

Cuboid



It is a solid figure with 6 rectangular surfaces.

- Volume of a cuboid = length × breadth × height cubic units.

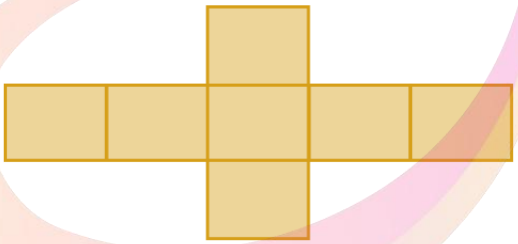
  V = l × b × h

$$\therefore l = \frac{V}{bh}; \quad b = \frac{V}{lh}; \quad h = \frac{V}{lb};$$

  The shape obtained on opening a solid shape is called a net.

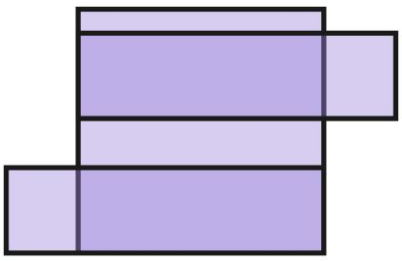
- A net can be folded back or closed into form a solid.

Net of a cube



The net of a cube has 6 squares.

Net of a cuboid



The net of a cuboid has 6 rectangles.

➢ FUNDAMENTALS

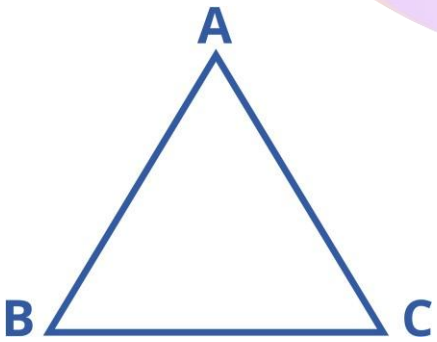
Perimeter

Perimeter, the length of the sides enclosing the figure is called its perimeter.

Perimeter of square = 4 × side = 4a

Perimeter of rectangle = 2 (length + breadth) =2(l+b)

Perimeter of triangle = sum of its sides = (AB + BC + CA)

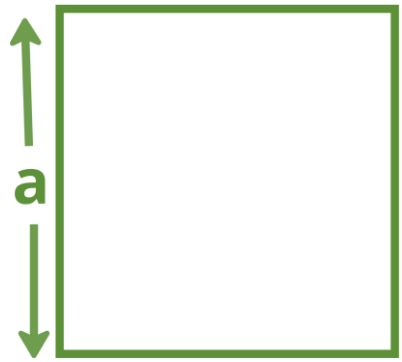


Area

The area of any figure is the plane space occupied by it or the amount of surface enclosed within its boundary lines.

It is measured in square units i.e. Square meter (m^2), Square centimeter (cm^2) etc.

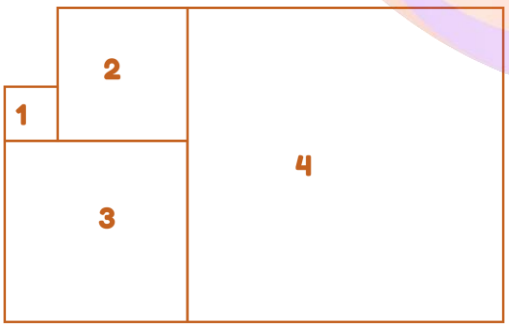
Area of square = $(side)^2 = a^2$ sq.unit



Area of rectangle = length × breadth = l × b Sq. unit.

Questions:

1. In the figures 1, 2, 3, and 4 are Squares. The perimeter of the Square 2 a respectively 16 and 20 units. Find the area of whole figure.



(a) 320 Sq. unit

(b) 318 Sq. unit

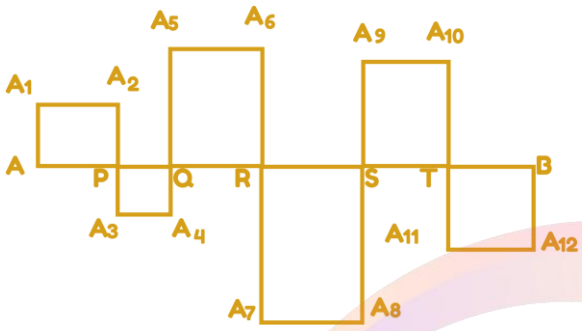
(4)

(c) 314 Sq. unit

(d) 321 Sq. unit

2. AB is a line segment 2017 cm long. Squares are drawn as shown in the diagram. The length of the line segment.

A A_1 A_2 A_3 A_4 A_5 A_6 A_7 A_8 A_9 A_{10} A_{11} A_{12} B is:



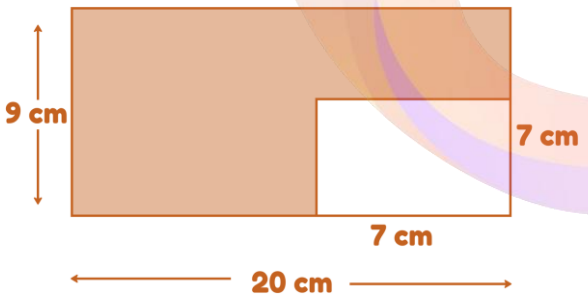
(a) 2017 cm

(b) 4022 cm

(c) 6051 cm

(d) 7051 cm

3. In the given figure, what is the area of shaded portion?



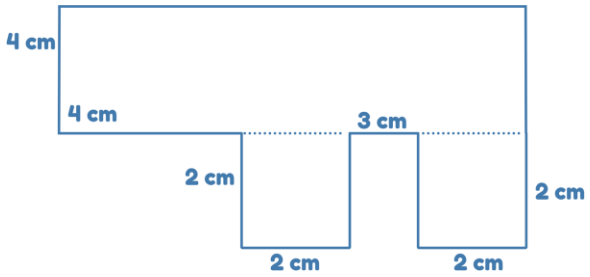
(a) 144 cm^2

(b) 131 cm^2

(c) 124 cm^2

(d) 126 cm^2

4. Find the area of the given figure.



(a) 52 cm^2

(b) 42 cm^2

(c) 60 cm^2

(d) 70 cm^2

5. A marble tile measure 25 cm by 20 cm. How many tiles be required to cover a wall of size 4 in by 3 m?

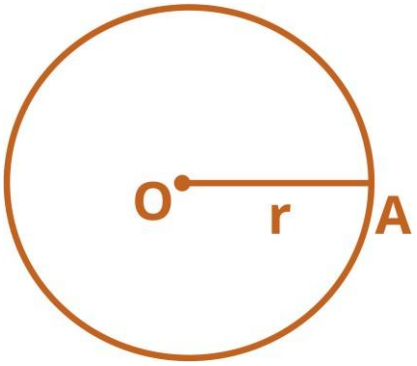
(a) 120

(b) 230

(c) 240

(d) 200

6. Find the area of the given figure.



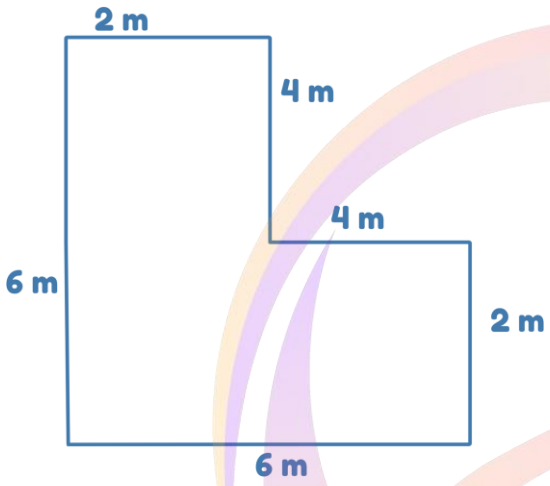
(a) πr^2

(b) $2\pi r$

(c) $\frac{\pi}{2}$(~~c~~)

(d) πr^2

7. Mrs. Razdan wants to use tiles of length 20 cm and breadth 10 cm to cover the floor of her balcony shown in the figure. What is the area of balcony? How many tiles does she need to buy (1 Sqm = 10,000 Sq. cm)?



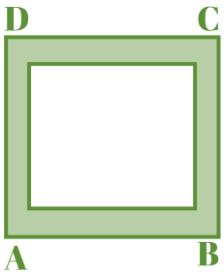
(a) 20 Sq. m, 1000 tiles

(b) 30 Sq. m, 2000 tiles

(c) 40 Sq. m, 5000 tiles

(d) 50 Sq. m, 2000 tiles

8. It is given that ABCD and EFGH are two squares and its sides are 14 cm and 10 cm respectively, find the Area of the shaded region.



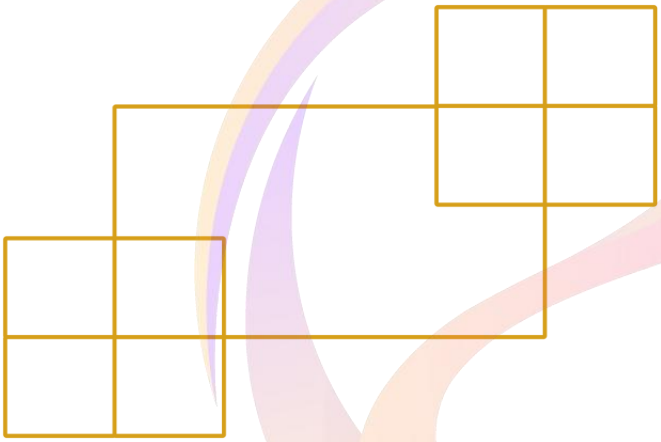
(a) 96 cm^2

(b) 94 cm^2

(c) 15 cm^2

(d) 18 cm^2

9. How many squares are there in the given figure?



(a) 10

(b) 12

(c) 13

(d) 14