

General instructions for Students: Whatever be the notes provided, everything must be copied in the Mathematics copy and then do the HOMEWORK in the same copy.

CLASS – 8th 18. MENSURATION (Part – II) MATHEMATICS

Surface area of a cube =  $4a^2$

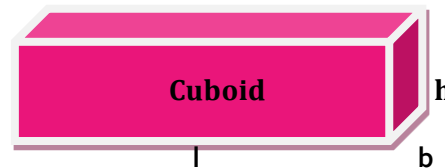
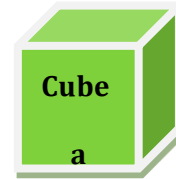
Total surface area of a cube =  $6a^2$

Volume of a cube =  $a^3$

Surface area of a cuboid =  $2h(l + b)$

Total surface area of a cuboid =  $2(lb + bh + hl)$

Volume of a cuboid =  $l \times b \times h$



**EXERCISE – 18.3**

3. Find the height of a cuboid whose volume is  $312 \text{ cm}^3$  and base area is  $26 \text{ cm}^2$ .

**Solution:** Volume of a cuboid =  $312 \text{ cm}^3$

$$\Rightarrow l \times b \times h = 312 \text{ cm}^3$$

$$\Rightarrow 26 \times h = 312 \quad \{ \text{Given : } l \times b = 26 \text{ cm}^2 \}$$

$$\Rightarrow h = \frac{312}{26} = 12 \text{ cm} \quad \text{Ans.}$$

6. If each edge of a cube is tripled, find how many times will its volume becomes ?

**Solution:** Let edge of a cube be  $a$  units. Volume of a cube =  $a^3$

If each edge of a cube is tripled i.e.  $3a$ , then volume of a cube =  $(3a)^3 = 27a^3$

Hence, volume becomes 27 times **Ans.**

**EXERCISE – 18.4**

1. The surface area of a cube is  $384 \text{ cm}^2$ . Find

- (i) length of an edge      (ii) volume of the cube

**Solution:** Surface area of a cube =  $384 \text{ cm}^2$

$$\Rightarrow 6a^2 = 384 \Rightarrow a = 8 \text{ cm} \quad \text{Ans.}$$

$$\text{Volume of the cube} = a^3 = 8^3 = 512 \text{ cm}^3 \quad \text{Ans.}$$

9. The length, breadth and height of a rectangular solid are in the ratio 5 : 4 : 2.

If its total surface area is  $1216 \text{ cm}^2$ , find the volume of the solid.

**Solution:** Let length, breadth and height of a rectangular solid are  $5x$ ,  $4x$  and  $2x$ .

Total surface area of a rectangular solid =  $1216 \text{ cm}^2$

$$\Rightarrow 2(5x \times 4x + 4x \times 2x + 2x \times 5x) = 1216$$

$$\Rightarrow 38x^2 = 608 \Rightarrow x^2 = \frac{608}{38} = 16 \Rightarrow x = 4$$

So, Length =  $5 \times 4 = 20 \text{ cm}$

Breadth =  $4 \times 4 = 16 \text{ cm}$

Height =  $2 \times 4 = 8 \text{ cm}$

Volume of the solid =  $20 \times 16 \times 8 = 960 \text{ cm}^3$  **Ans.**

### **HOMEWORK**

**EXERCISE – 18.3 Q.No. : 2, 5 and 7**

**EXERCISE – 18.4 Q.No. : 5, 6, 7, 8 and 11**

## MATHS PRACTICAL

### ***Points to remember .***

*\*Read and understand the experiment.*

*\*In the Maths Practical Copy write down AIM, MATERIAL REQUIRED, METHODOLOGY, TABULAR COLUMN and CONCLUSION on the ruled page. DIAGRAM and CALCULATION on the plane page.*

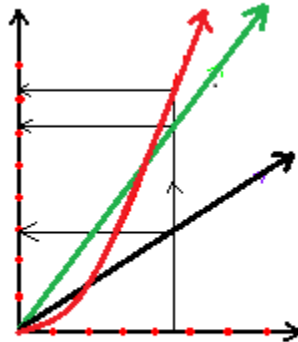
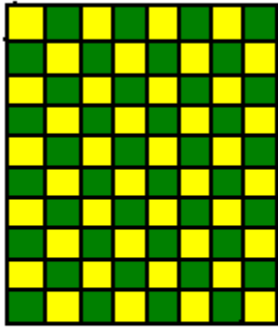
*\*Follow the PROCEDURE properly to get the correct conclusion.*

*\*MATHS PRACTICAL COPY must be a soft cover Lab copy with atleast 50 to 60 pages.*

### EXPERIMENT NO. 3

**AIM:** To find the graphical relationship between (i) 'side' & 'area', (ii) 'side' & 'perimeter' and (iii) 'side' & 'diagonal' of squares of different dimensions. Also find from the graph, find 'area', 'perimeter' and 'diagonal' of a square when the Side of the square is (i) 2.5cm and (ii) 4.1cm .

**MATERIAL REQUIRED:** 1) A chart of squares of dimension 1cm/ Graph paper . 2) Ruler. 3) Graph paper.



$a_{ij}$  is the position of the corner of the square in the  $i$ <sup>th</sup> row and  $j$ <sup>th</sup> column.

**PROCEDURE:** Select any one of the square from the chart or from the graph sheet and mark the square . Measure its side, diagonal and perimeter by using a ruler. Count the number of squares (i.e, area) enclosed in the selected square. Repeat the above procedure by selecting squares of different dimensions. Note down the observations in the observation table. ( In case squares are selected from the graph paper, attach the graph paper in the lab copy as practical work and mark the squares which are selected) . Plot the measure of the side of the square on the X-axis and all other data (perimeter, diagonal and area) on Y-axis. Observe the graph obtained in each case (i.e.diagonal against side, perimeter against side and area against side) and write down the conclusion.Also draw a vertical line to meet the graphs at the point corresponding to the given side of the square. Draw horizontal lines at the points where the vertical line meets the graphs . The horizontal lines meets the Y-axis in three points. The corresponding values are diagonal , perimeter and area.

**OBSERVATION TABLE :**

Trial no.	Square	Side (cm)	Diagonal (cm)	Perimeter (cm)	Area ( $cm^2$ )
1					
2					
3					
4					

**CONCLUSION:** Relationship between

i) side & diagonal is -----(linear/ nonlinear),

ii) side& perimeter is -----( linear/ nonlinear),

and iii) side & area is -----( linear/ nonlinear).

iv) When side = 2.5cm , then area = -----, perimeter = ---- and diagonal= -----.

v) When side = 4.1cm , then area = -----, perimeter = ---- and diagonal= -----.