Mensuration

Basic Geometrical figures

Rectangle

$A = \ell \times b$, $P = 2(\ell + b)$

Square

Area $= a^2$, $P = 4a$

Parallelogram

Area = Base ´ height

Triangle

Area $= \frac{1}{2} \times$ base $\times$ Height

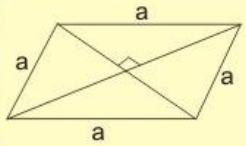
Eq. $\Delta = \frac{\sqrt{3}}{4}$ side^2

Circle

Area $= \pi r^2$

Circumference $= 2\pi r$

Rhombus

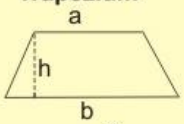


Area $= \frac{1}{2} d_1 d_2$

Perimeter $= 4a$

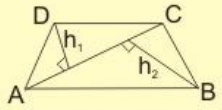
$a^2 = \frac{d_1^2}{4} + \frac{d_2^2}{4}$

Trapezium



Area $= \frac{1}{2}(a+b)h$

Quadrilateral



Area $= \frac{1}{2}(AC)(h_1+h_2)$

Chart

Plane Figures

Figure having two dimensions are called plane figures.

Ex. Square, Rectangle, Circle, Triangle etc.

Solid Figures

Figure having three dimensions are called solid figures.

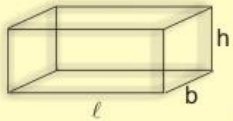
Ex. Cube, Cuboid, Cylinder, etc.

Cuboid

T.S.A. $= 2(\ell b + bh + h\ell)$

L.S.A. $= 2h(\ell + b)$

$V = \ell bh$

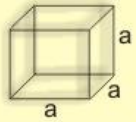


Cube

L.S.A. $= 4a^2$

T.S.A. $= 6a^2$

$V = a^3$

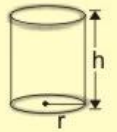


Cylinder

C.S.A. $= 2\pi rh$

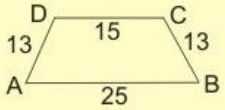
T.S.A. $= 2\pi r\,(h+r)$

$V = \pi r^2 h$



Problem of Plane Figures

Q. Find the area of trapezium



Sol. Draw CE ||AD

$\therefore$ AECD is ||gm

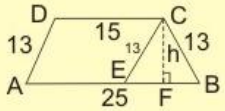
EC = AD = 13

AE = DC = 15

$\therefore$ BE = AB – AE

= 25 – 15

= 10



$EF = FB = \frac{1}{2} EB = 5$

In ΔCFB

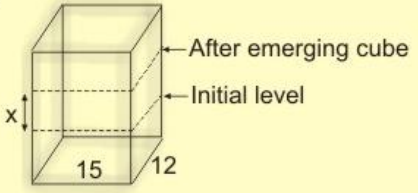
$h = \sqrt{13^2 - 5^2} = 12$

ar trap. $ABCD = \frac{1}{2}(25 + 15)12 = 240$ sq. unit

Problem of solid Figures

Q. A cube of 9 cm edge is immersed completely in a rectangular vessel contaning water. If the dimension of the base are 15 cm and 12 cm find rise in water level in the vessel.

Sol.



Volume of cube = Volume of cuboid of height x

$9 \times 9 \times 9 = 15 \times 20 \times x$

$x = \frac{9 \times 9 \times 9}{15 \times 20} = 2.43$ cm