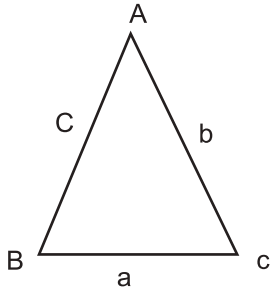


CHAPTER-12 HERON'S FORMULA MIND MAPPING

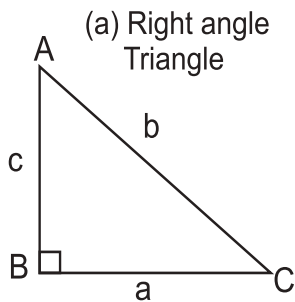


$$\text{Semi-Perimeter} = \frac{a+b+c}{2} = S$$

$$\text{Area of Triangle} = \sqrt{S(S-a)(S-b)(S-c)}$$

Heron's Formula

Perimeter and Area of Triangles



$$b^2 = a^2 + c^2$$

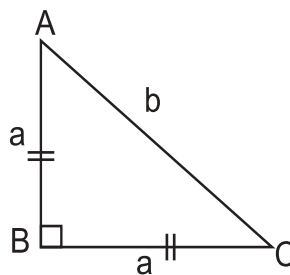
(Pythagorus Thorem)

$$\text{Perimeter} = a+b+c$$

$$\text{Area} = \frac{1}{2} \text{ axc}$$

$$= \frac{1}{2} \text{ basexheight}$$

(b) Isosceles Right Triangle



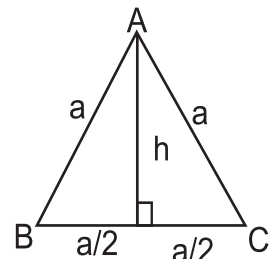
$$b^2 = 2a^2$$

(Pythagorus Thorem)

$$\text{Perimeter} = 2a+ b$$

$$\text{Area} = \frac{1}{2} a^2$$

(c) Equilateral Triangle



$$\text{Perimeter} = 3a$$

$$\text{Height} = \frac{\sqrt{3}}{2} a$$

$$\text{Area} = \frac{1}{2} \times a \times h$$

$$= \frac{1}{2} \text{ ax} \frac{\sqrt{3}}{2} a$$

$$= \frac{\sqrt{3}}{4} a^2$$

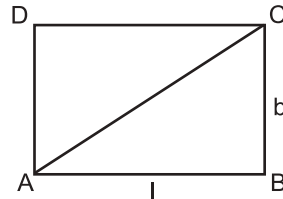
CHAPTER-12

HERON'S FORMULA

KEY POINTS

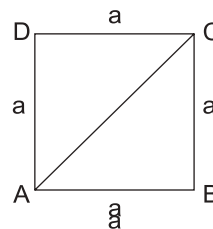
- Rectangle : If length and breadth of a rectangle is 'l' and 'b' respectively then

- (i) Perimeter of rectangle = $2(l + b)$ units
- (ii) Area of rectangle = $l \times b$ sq. units
- (iii) Diagonal of rectangle = $\sqrt{l^2 + b^2}$ units



- Square : If 'a' is the length of side of a square

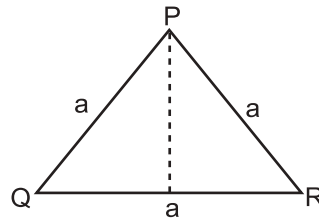
- (i) Perimeter of square = $4a$ units
- (ii) Area of square = $(\text{side})^2 = (a)^2$ sq. units
- (iii) Area of square = $\frac{1}{2} \times (\text{diagonal})^2$



- Triangle :

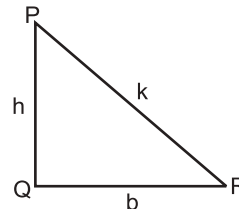
- (A) Equilateral Triangle : In this triangle all three sides are equal. If the length of each side is 'a' then

- (i) Perimeter = $3a$ units
- (ii) Altitude = $\frac{\sqrt{3}}{2} a$ units
- (iii) Area = $\frac{\sqrt{3}}{4} a^2$ or $\frac{\sqrt{3}}{4} (\text{side})^2$ sq. units



- (B) Right Angled Triangle : If one of the angles of a triangle is 90° .

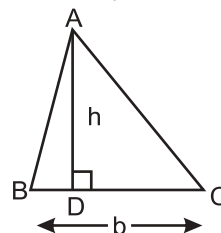
- (i) Hypotenuse $k = \sqrt{b^2 + h^2}$ units
- (ii) Perimeter = $b + h + k$ units
- (iii) Area = $\frac{1}{2} \times b \times h$ sq. units



Area of triangle (General Formula)

$$= \frac{1}{2} \times \text{base} \times \text{Corresponding Altitude}$$

$$= \frac{1}{2} \times b \times h \text{ sq. units}$$



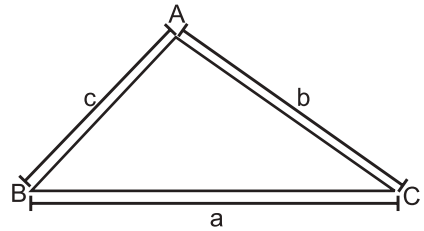
HERON'S FORMULA

- If the sides of triangle are a, b and c

(i) Perimeter = $a + b + c$

(ii) Semi Perimeter (S) = $\frac{a+b+c}{2}$

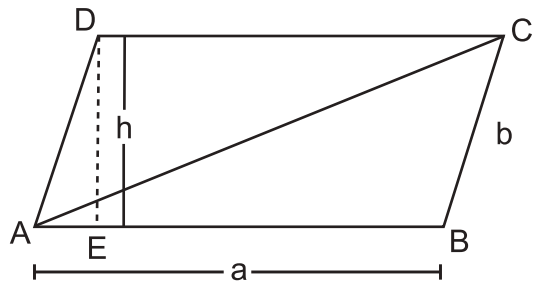
(iii) Area of Triangle (ΔABC) = $\sqrt{s(s-a)(s-b)(s-c)}$



Note : Heron's formula is applicable to all types of triangles.

- Area of Parallelogram : If a is the length and b is breadth of a parallelogram and h be the height or perpendicular distance between two parallel sides then.

Area of parallelogram (ABCD)
 = Base x Corresponding Height
 = AB x DE
 = $a \times h$ sq. units



Area of $\Delta ABC = \frac{1}{2} \times \text{Area of Parallelogram}$

- Area of Trapezium : Trapezium with parallel sides a and b and the perpendicular distance between two parallel sides as h.

Area of trapezium
 = $\frac{1}{2} \times (a + b) \times h$
 = $\frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$

