

$$\text{ar}(\triangle ABC) = \sqrt{s(s-a)(s-b)(s-c)}$$

$$\text{where } s = \frac{a+b+c}{2}$$

and a, b and c are three sides of the given triangle.

Perimeter :

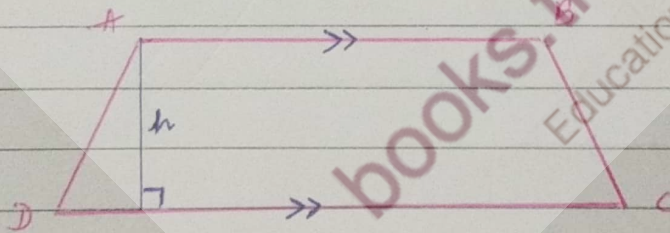
• Perimeter of any triangle = sum of three sides of triangle
= $s_1 + s_2 + s_3$

, where s_1, s_2 and s_3 are the three sides of the given triangle.

17 November 2018 # QUADRILATERALS:

• A polygon with four sides.

1. Trapezium :



• properties: • $AB \parallel DC$ (one pair of sides are parallel)

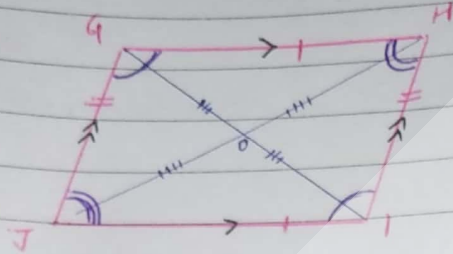
• perimeter = sum of length of all sides

• area (ABCD) = $\frac{1}{2} \times (a+b) \times h$

where, $h \rightarrow$ height (distance between two parallel sides)

'a' and 'b' are two parallel sides

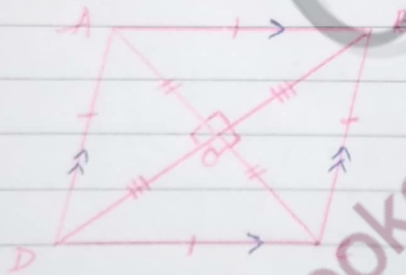
2. Parallelogram:



• Diagonals bisect each other

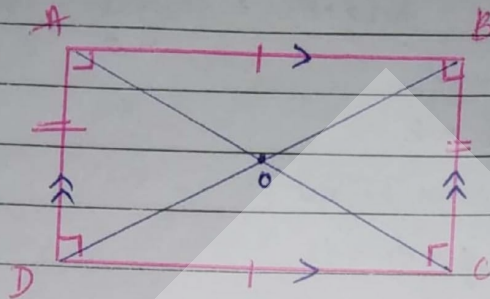
- Opposite sides are parallel and equal
i.e. $GH \parallel JI$ also $GH = JI$
and $GJ \parallel HI$ also $GJ = HI$
- Opposite angles are equal
i.e. $\angle G = \angle I$ and $\angle H = \angle J$
- Opposite angles are supplementary
i.e. $\angle J + \angle H = 180^\circ$ and $\angle G + \angle I = 180^\circ$

3. Rhombus:



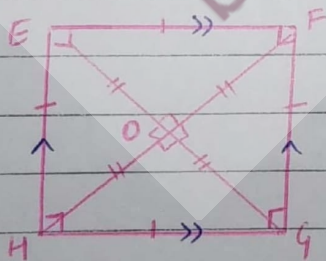
- Opposite sides are parallel i.e. $AB \parallel CD$ and $AD \parallel BC$
- All sides are equal
i.e. $AB = BC = CD = AD$
- Opposite angles are equal
i.e. $\angle A = \angle C$ and $\angle B = \angle D$
- Diagonals are perpendicular bisectors of each other
i.e. $AC \perp BD$ (\because perpendicular)
and $AO = OC$; $BO = OD$ (\because bisectors)

4. Rectangle:



- Opposite sides are equal
 - ie. $AB = CD$ and $AD = BC$
- Opposite sides are parallel
 - ie. $AB \parallel CD$ and $AD \parallel BC$
- All angles are equal to 90°
 - ie. $\angle A = \angle B = \angle C = \angle D = 90^\circ$
- Diagonals are equal
 - ie. $AC = BD$
- Diagonals bisect each other ie.
 - $AO = OC$
 - and $OB = OD$

5. Square:



- All interior angles are equal to 90°
- The diagonals of a square are equal and bisect each other
- Opposite sides are parallel
- All sides are equal.

FORMULAE FOR AREA OF QUADRILATERALS:

6 - Ar (trapezium) = $\frac{h}{2}(a+b)$ = $\frac{\text{height} \times (\text{sum of 2 sides})}{2}$

7 - Ar (parallelogram)
= $b \times h$
= base \times height

8 - Ar (rhombus) = $\frac{1}{2} \times d_1 \times d_2$
= $\frac{1}{2} \times (\text{diagonal 1}) \times (\text{diagonal 2})$

9 - Ar (rectangle) = $l \times b$
= length \times breadth

10 - Ar (square) = s^2
= (side)²
= (side) \times (side).

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