

CHAPTER FOURTEEN

CONSTRUCTION

Areas of some geometrical figures:

Rectangles:



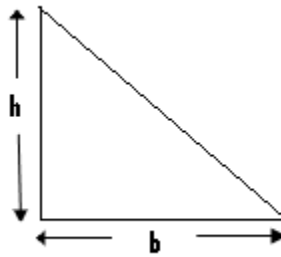
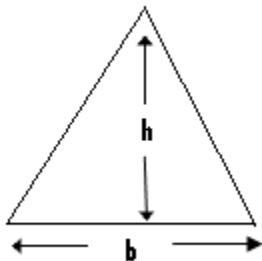
L = the length.

B = the breadth or width.

The area = $L \times B$.

Triangle:

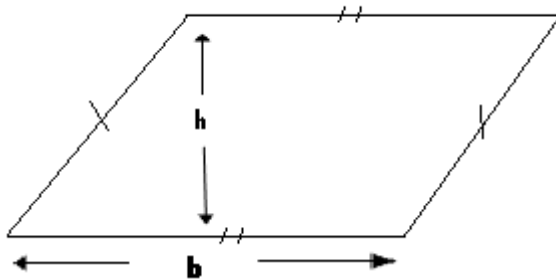
- This is a three sided figure.



The area = $\frac{1}{2} b \times h = \frac{b \times h}{2}$ where b = the base and h = the height.

Parallelogram:

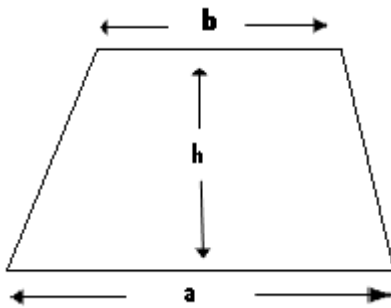
- This is a four sided figure, in which both pairs of its opposite sides are parallel.



The area of a parallelogram = $b \times h$, where b = the base and h = the height.

The trapezium:

- This is a four sided figure, which has its pair of opposite sides being parallel.

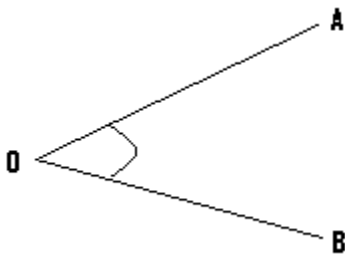


Area = $\left(\frac{a+b}{2}\right) \times h$, where h = the height and a and b are the parallel sides.

Angles:

- An angle is formed when two straight line meet at a point.

Example:



- In the above given figure, the lines OA and OB meet at the point O.
- The angle formed is angle AOB or angle BOA.

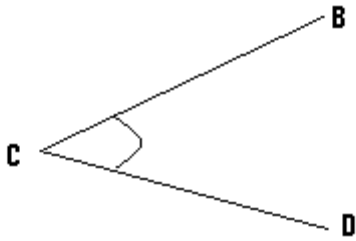
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- Angle AOB can be written as $\angle AOB$ or $\angle BOA$, while angle BOA can be written as $\angle BOA$ or $\angle AOB$.

BISECTION OF ANGLES:

- To bisect a given angle means to divide it into two equal parts.

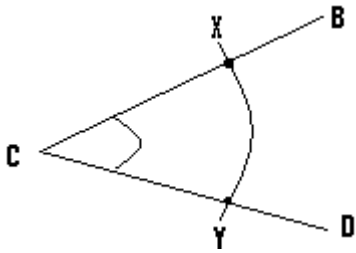
Examples(I):



In the given figure, bisect $\angle BCD$.

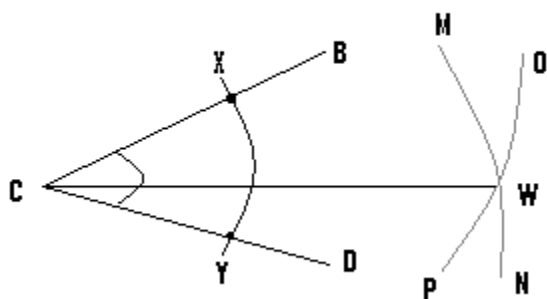
Steps:

(I)



- Open your compass to a suitable length, and with its pin positioned at C, draw an arc to cut line CB at point X and line CD at point Y.

(II)



- Open your compass to a greater length and with its pin now positioned at point X, draw arc OP.
- With the same length and the pin now positioned at the point Y, draw arc MN and let the meeting point or the point of intersection of these two arcs be W.
- Finally draw a line to pass through the points C and W.
- By so doing, we have bisected $\angle BCD$.

The bisector:

- This may also be referred to as the perpendicular bisector.
- The bisector can be drawn to pass through a line, and by so doing, it will divide the line into two equal parts or lengths.
- On the other hand, a bisector can be drawn to pass through a given point.

Construction of the bisector of a line:

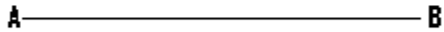
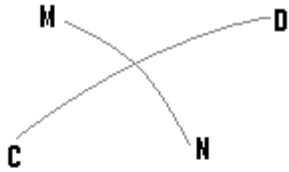
Example:



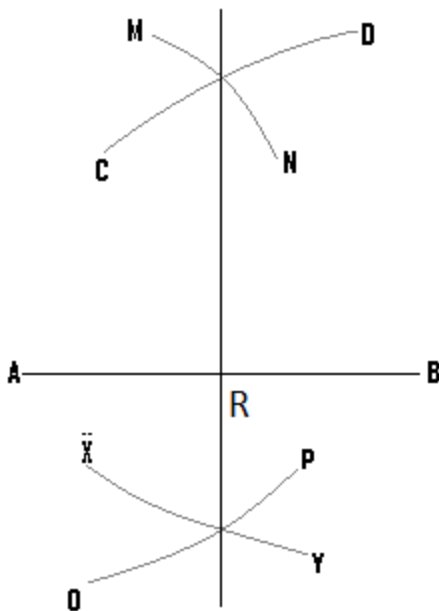
Line AB is of length 6cm. Construct the bisector of this line.

Steps:

(a)



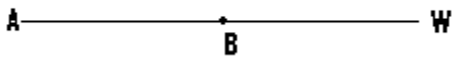
- Open your compass to a suitable length, and with its pin positioned at point B, draw arcs CD and XY.
 - Using the same length and the pin now positioned at point A, draw arcs MN, and OP.
- (b) Finally draw a line to pass through the meeting points, or the points of intersection of the various arcs.



N/B: $AR = RB$.

Bisector which passes through a given point:

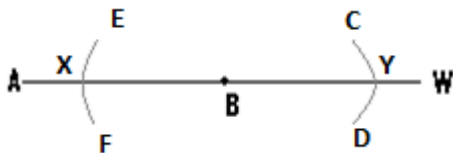
Example:



Construct the perpendicular bisector which passes through the point B.

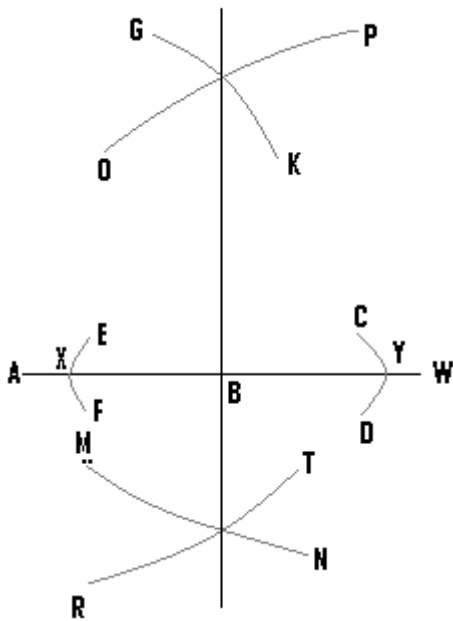
Steps:

(1)



- Open your compass to a suitable length, and with the pin positioned at point B, draw arcs CD and EF.

(2)



- Open the compass to a greater length, and with the pin positioned at point Y, draw arcs OP and MN.
- Using the same length and with the pin now positioned at point X, draw arcs GK and RT.
- Finally a line drawn to pass through the points of intersection of the various arcs, which is the bisector, will pass through the point B.

Locus of points equidistant from two points:

- Equidistance means equal distance.
- To construct the locus of points which are equidistant from two points, is to determine the various points which are of equal distance away, from these two points.

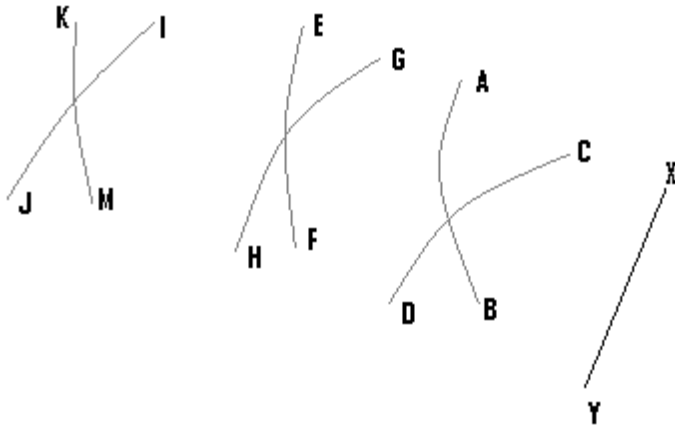
Examples:



Construct the locus of all the points, which are equidistant from X and Y.

Steps:

(1)



- Open your compass to an appropriate length, and with the pin positioned at the point X, draw arc AB.
- Using the same length and with the pin now positioned at the point Y, draw arc CD.
- Open your compass to a different or a greater length, and with the pin position at point X, draw arc EF.
- Using the same length and with the pin now positioned at the point Y, draw arc GH.
- Using a different length and the same procedure, we construct arcs JI and KM.