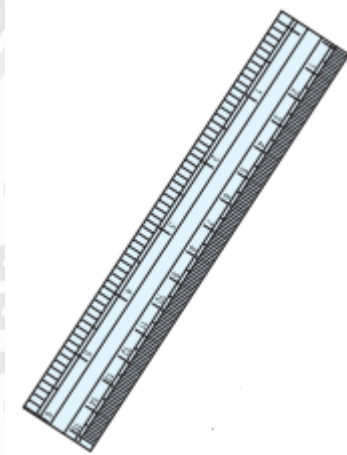# Chapter 14

# Practical Geometry

In this chapter we shall learn to make different shapes using some tools. We shall begin with listing these tools, describing them and looking at how they are used.

**1. The Ruler**

A ruler is a tool used to measure straight lines and measure distances. This ruler is marked in cm (centimetres) along the top and inches along the bottom.
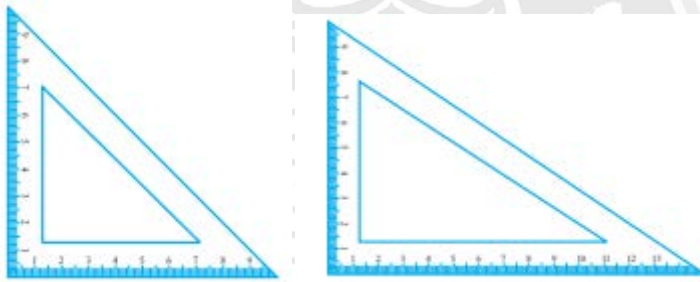
**2. The compasses**

Pencil    Pointer

A compass is a drawing instrument used for drawing circles and arcs. It has two legs, one with a point and the other with a pencil or lead.

### 3. The Divider

The Divider is a pair of pointers to compare lengths.

### 4. Set-Squares

Set-Squares are the two triangular pieces- one of them has 45°, 45°, 90° angles at the vertices and the other has 30°, 60°, 90° angles at all the vertices. It is use to draw perpendicular and parallel lines.

### 5. The protractor
It is a semi-circular device graduated into 180 degree-parts.the measure start from 0° on the right hand side and ends with 180° on the left hand side and vice versa. It is use to draw and measure angles.
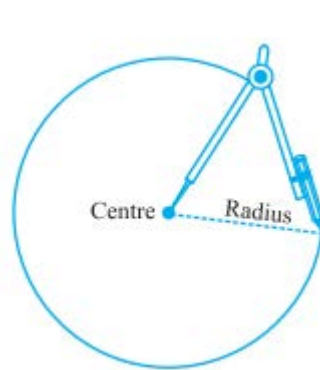
Centre Point

### Circle

A circle is a set of all points in a plane that are equidistant from a point i.e. centre of the circle.

### Construction of a Circle when its radius is known

Steps for constructing a circle using a compass:

(i)      Open compass for the required radius.
(ii)     Place pointer of the compass on O.
(iii)    Rotate the compass slowly to draw the circle.



### Line segment

A line segment is a part of a line that is bounded by two distinct end points. It can be measure with the help of a ruler.
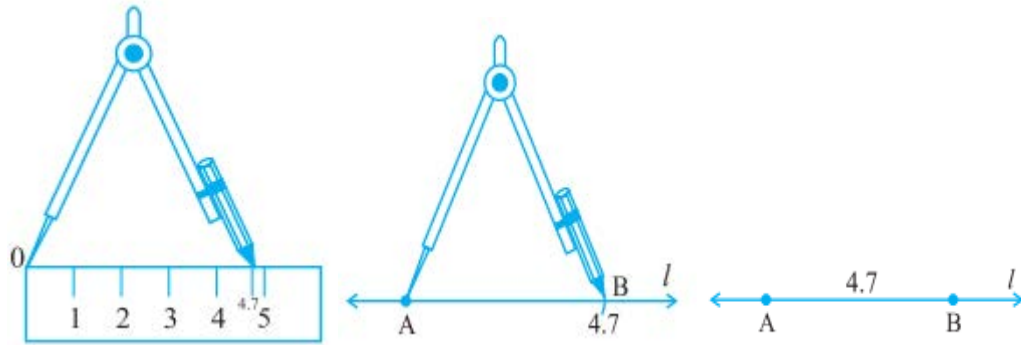


### Construction of a Line Segment of a given length

A better method would be to use compasses to construct a line segment of a given length.

Step:

1.  A line l is drawn and marked a point A on it.

2.  Place the compass on the initial point of the ruler. Open it to place pencil point up to the 4.7 cm mark.

3.  Place the pointer on A and draw an arc to cut l at B. AB is the required line segment.

## Constructing Copy of a Line Segment

Steps for constructing a copy of a given line segment using ruler and compass together:

(i)     Given AB whose length is unknown.

(ii)     Fix compass' pointer on A and pencil end on B. The opening of the instrument now gives the length of AB.

(iii)    We draw any line *l*.Placing the pointer on C, draw an arc that cuts *l* at a point say D. Then, CD = AB
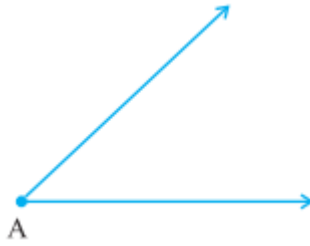
## Perpendiculars

A line JK meeting another line AB at the right angle is said to be the perpendicular to the line AB.
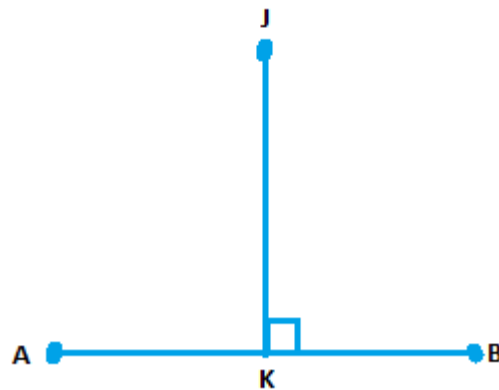
**Angles**

Angles are formed by two rays sharing a common endpoint.



**Constructing of an Angle with Unknown Measurement**

Steps for constructing a copy of an angle with unknown measurement:

   (i)     We draw a line l and choose a point P on it.

   (ii)    Place compass pointer at A and draw an arc to cut the rays of ∠A at B and C.

   (iii)   We draw an arc with P as the centre, cutting at Q.

   (iv)    Set your compasses to length BC with the same radius.

   (v)     Place the compasses pointer at Q and draw an arc to cut the arc drawn earlier in R.

   (vi)    Join PR. This gives ∠P=∠A.