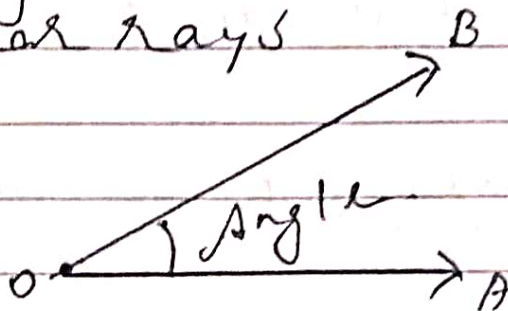# Trigonometric functions.

In this chapter, we will generalise the concept of trigonometric ratios to trigonometric functions and study their properties.

(i) Angles.

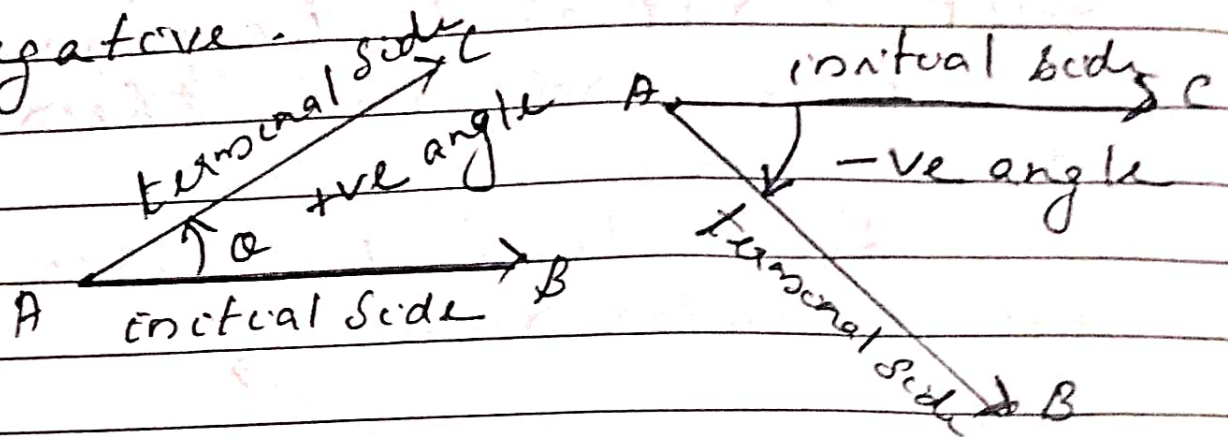An angle is the union of two non-collinear rays

An angle is obtained by rotating a ray from one position to another. In this case the initial position of the rotating ray is called the initial side and the final position of the ray is called the ~~terminal~~ terminal side.

The direction can be taken in two senses: positive and negative.

(i) an angle formed by the rotation of a ray in the counter-clockwise

(anticlockwise) direction is taken as positive and angle formed by the rotation of a ray in the clockwise direction is taken as negative.

Measurement of angles.

There are three systems for measuring angles.
(1) Sexagesimal or English system
(2) Centesimal or French system
(3) Circular system.

(1) Sexagesimal System:

1 right angle $= 90$ degree $(= 90°)$

$1° = 60$ minutes $(= 60')$

$1' = 60$ seconds $(= 60'')$

In this system a right angle is divided into 90 equal parts, called degrees.

(2) Centesimal System.

$$1 \text{ right angle} = 100 \text{ grades } (= 100^g)$$
$$1^g = 100 \text{ minutes } (= 100')$$
$$1' = 100 \text{ Seconds } (= 100'')$$

In this system a right angle is divided into 100 equal parts, called grades.

(3) Circular system.

In this system the unit of measurement of an angle is radian one radian (1^c), is the measure of an angle subtended by at the centre of a circle by an arc whose length is equal to the radius of the circle.