6.1 Angle Measure

Positive and Negative Angles

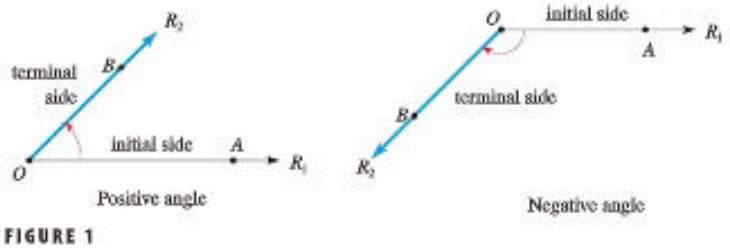

FIGURE 1

The measure of an angle is the amount of rotation about the vertex required to move the initial side onto the terminal side.

Units: I) *Degrees* – One degree is $\frac{1}{360}$ of a complete revolution.

1 degree = 60 minutes
1 minute = 60 seconds

II) *Radians* – One radian is the measure of a central angle (in a circle) that subtends an arc of length equal to its radius

$$360^\circ = 2p$$

Angles in standard position An angle is in standard position if it is drawn in the xy-plane with its vertex at the origin and its initial side on the positive *x*-axis.

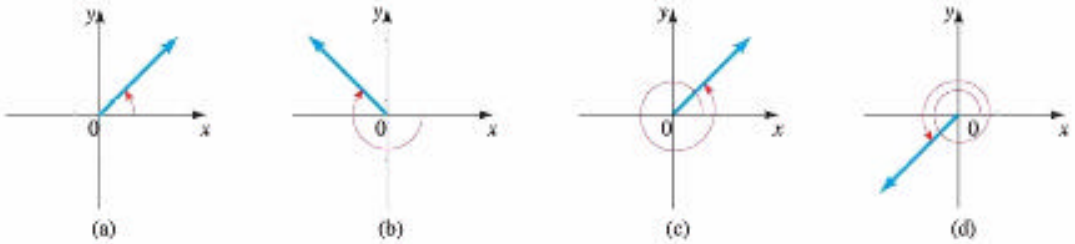

FIGURE 5 Angles in standard position

Coterminal angles Two angles are coterminal if their sides coincide. For examples, (a) and (c) are coterminal.

Length of a circular arc In a circle of radius r, the length of an arc that subtends a central angle of θ **radians** is

$$s = r\theta .$$

Area of a circular sector In a circle of radius r, the area A of a sector with a central angle of θ **radians** is

$$A = \frac{1}{2} r^2 \theta$$

Linear speed of an object traveling in circular motion

$$v = \frac{s}{t}$$

v = linear speed of the object that moves around a circle of radius r

s = distance traveled in time t around the circle

Angular speed of the object traveling in circular motion

$$\omega = \frac{\theta}{t}$$

ω = angular speed of the object that moves around a circle

θ = angle(in radians) that is swept out in time t

$$v = r\omega$$