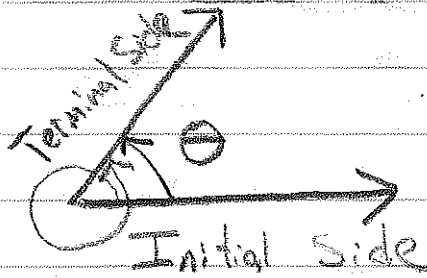


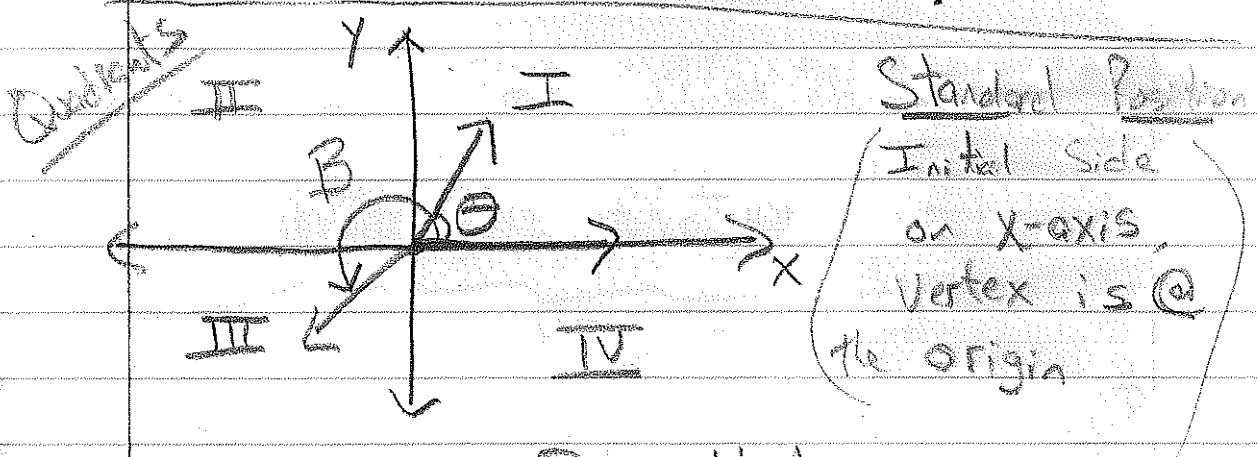
Trigonometry: Angles and Measure



Suppose $\theta = 50^\circ$

$50^\circ \rightsquigarrow 410^\circ$

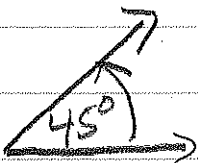
You may have positive or negative angles!



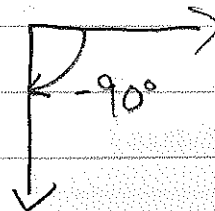
θ - theta
 β - Beta

Draw the following angles:

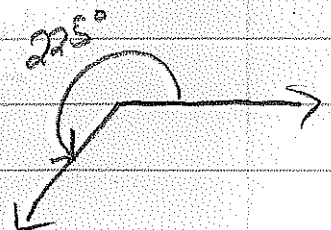
1) 45°



2) -90°



3) 225°



Degrees, Minutes, and Seconds

$$1 \text{ degree} = 60 \text{ minutes}$$

$$1 \text{ minute} = 60 \text{ seconds}$$

50 degrees, 40 minutes, 10 seconds: $50^{\circ}40'10''$

Convert $50^{\circ}40'10''$ to decimal degrees.

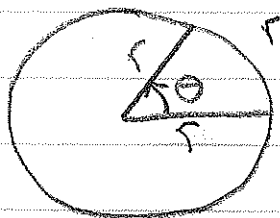
$$\left(50^{\circ} + 40\left(\frac{1}{60}\right) + 10\left(\frac{1}{60} \cdot \frac{1}{60}\right)\right)^{\circ}$$

$$\approx 50.6694$$

Convert 23.567° to DMS

$$\approx 23^{\circ}34'1''$$

Radians



1. Radian is the angle where the subtended arc is the length of the radius.

Arc Length Theorem

$$s = r\theta$$

arc length $\quad \quad \quad$ radius of circle $\quad \quad \quad$ Angle in radians

How many radians is 1 revolution?
(360°)

$$s = r\theta$$
$$\frac{2\pi r}{r} = \frac{r\theta}{r}$$
$$2\pi = \theta$$

$$360^\circ = 2\pi \text{ radians}$$

$$180^\circ = \pi \text{ radians}$$

Convert to radians:

1) 60°

$$60^\circ \left(\frac{\pi}{180^\circ} \right) = \frac{60\pi}{180}$$

$$= \frac{\pi}{3} \text{ radians}$$

2) 150°

$$150^\circ \left(\frac{\pi}{180^\circ} \right) = \frac{150\pi}{180}$$

$$= \frac{5\pi}{6} \text{ radians}$$

Convert to degrees.

1) $\frac{\pi}{6}$

$$\frac{\pi}{6} \left(\frac{180^\circ}{\pi} \right) = 30^\circ$$

2) $\frac{3\pi}{2}$

$$\frac{3\pi}{2} \left(\frac{180^\circ}{\pi} \right) = \frac{540}{2}$$

$$= 270^\circ$$