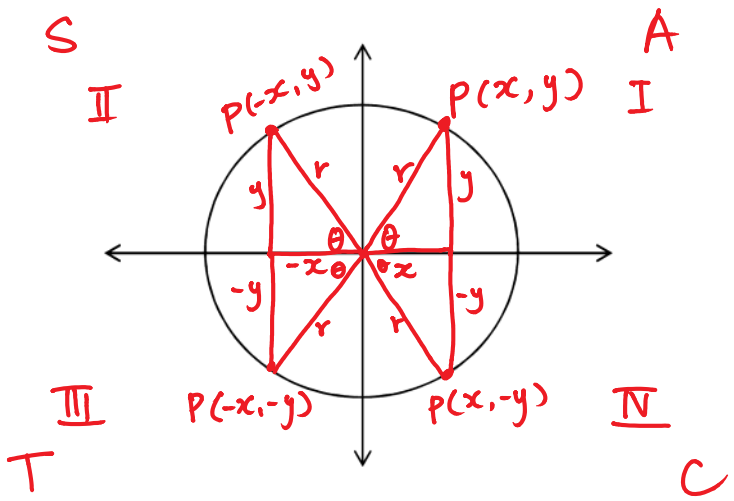
Lesson 2.2.1

Saturday, February 4, 2017 4:35 PM

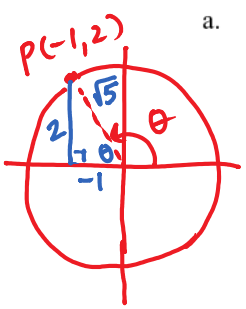


The signs of each trigonometric function in each quadrant is given by:

	I	II	III	IV
sin	$\frac{y}{r}$ +	$\frac{y}{r}$ +	$\frac{-y}{r}$ −	$\frac{-y}{r}$ −
cos	$\frac{x}{r}$ +	$\frac{-x}{r}$ −	$\frac{-x}{r}$ −	$\frac{x}{r}$ +
tan	$\frac{y}{x}$ +	$\frac{y}{-x}$ −	$\frac{-y}{-x}$ +	$\frac{-y}{x}$ −
	All	Sin	Tan	Cos
	All	Students	Take	Calculus

Example 1: The point P(-1, 2) is on the terminal arm of angle θ.

a. Draw a diagram showing θ in standard position.



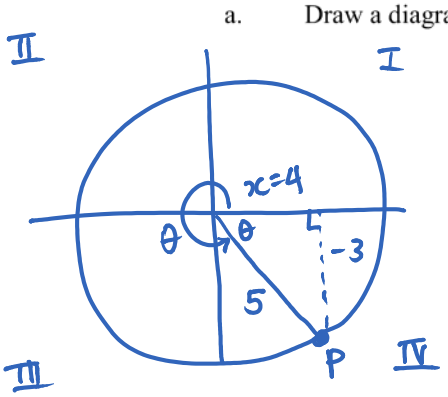
$$a^2 + b^2 = c^2$$
$$(-1)^2 + (2)^2 = c^2$$
$$1 + 4 = r^2$$
$$5 = r^2$$
$$\sqrt{5} = r$$

b. Calculate $\sin\theta$, $\cos\theta$, $\tan\theta$.

$\sin\theta = \frac{2}{\sqrt{5}}$ $\cos\theta = \frac{-1}{\sqrt{5}}$ $\tan\theta = \frac{2}{-1} = -2$

Example 2: The angle θ is in the fourth quadrant and $\sin\theta = \frac{-3}{5}$. $\frac{opp}{hyp}$

a. Draw a diagram showing θ in standard position.



Find x:

$x^2 + (-3)^2 = 5^2$

$x^2 = 25 - 9$

$x^2 = 16$

$x = \pm 4$ $\cancel{-4}$ reject $+4$.

b. Determine possible coordinates for P.

$P(4, -3)$

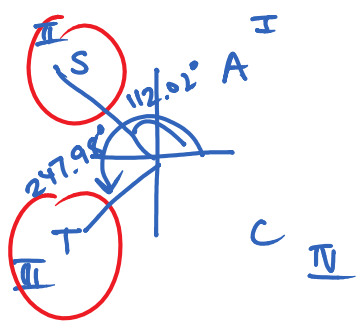
c. Find $\cos\theta$ and $\tan\theta$.

$\cos\theta = \frac{4}{5}$

$\tan\theta = -\frac{3}{4}$

Example 3: Solve the equation $\cos\theta = -0.375$ where $0^\circ \le \theta < 360^\circ$.

negative ratio, so Q II or III



$\theta = \cos^{-1}(-0.375)$

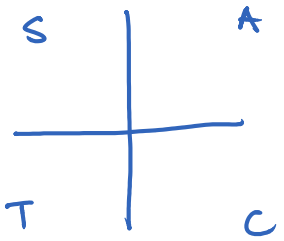
$\theta = \boxed{112.02^\circ}$

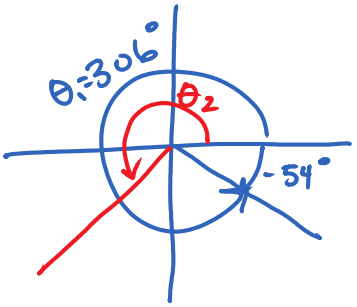
$\theta_R = 180 - 112.02 = 67.98^\circ$

$\theta = 180 + 67.98 = \boxed{247.98^\circ}$

Example 4: Determine angle θ given $\sin\theta = -0.809$ where $0^{\circ} \le \theta < 360^{\circ}$.

Q III or IV





$$\theta = \sin^{-1}(-0.809)$$
$$= -53.998^{\circ}$$
$$= -54^{\circ}$$

clock wise

$$\theta_1 = 360 - 54 = 306^{\circ}$$

$$\theta_2 = 180 + 54 = 234^{\circ}$$

Assignment: pg. 96 #1, 3-8, 11-13