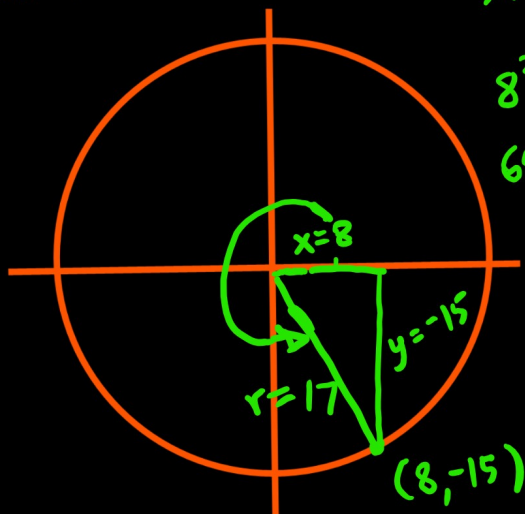


## Section 5.2

The terminal side of  $\theta$  passes through the point  $(8, -15)$ . Find the six trig function values of  $\theta$ .



$$x^2 + y^2 = r^2$$

$$8^2 + (-15)^2 = r^2$$

$$64 + 225 = r^2$$

$$289 = r^2$$

$$r = \sqrt{289}$$

$$r = 17$$

If we're not on the unit then

$$\sin \theta = \frac{y}{r} \quad \csc \theta = \frac{r}{y}$$

$$\cos \theta = \frac{x}{r} \quad \sec \theta = \frac{r}{x}$$

$$\tan \theta = \frac{y}{x} \quad \cot \theta = \frac{x}{y}$$

$$\sin \theta = \frac{-15}{17}$$

$$\csc \theta = \frac{-17}{15}$$

$$\cos \theta = \frac{8}{17}$$

$$\sec \theta = \frac{17}{8}$$

$$\tan \theta = \frac{-15}{8}$$

$$\cot \theta = \frac{-8}{15}$$

<u>II</u> $x < 0, y > 0$ $\sin \theta, \csc \theta +$	<u>I</u> $x > 0, y > 0$ All +
$x < 0, y < 0$ $\tan \theta, \cot \theta +$ <u>III</u>	$x > 0, y < 0$ $\cos \theta, \sec \theta$ <u>IV</u>

$$\sin \theta > 0, \tan \theta < 0$$

Q II

$$\tan \theta > 0, \sec \theta < 0$$

Q III

## Assignment

- 1) If  $(-7, 24)$  lies on the terminal side of  $\theta$ , find the six trig function values of  $\theta$ .
- 2) If  $(-3, -7)$  lies on the terminal side of  $\theta$ , find the six trig function values of  $\theta$  (Rationalize your denominators)

3) Determine which quadrant  $\theta$  lies in:

- A)  $\sin\theta < 0, \cos\theta > 0$
- B)  $\cos\theta > 0, \tan\theta > 0$
- C)  $\cos\theta < 0, \tan\theta > 0$
- D)  $\csc\theta > 0, \cos\theta < 0$

4) Find exact values using your unit circle:

- A)  $\cos 420^\circ$
- B)  $\sin 390^\circ$
- C)  $\csc 450^\circ$
- D)  $\sec 420^\circ$
- E)  $\sin \frac{9\pi}{4}$
- F)  $\csc \frac{9\pi}{2}$
- G)  $\cot \frac{17\pi}{4}$
- H)  $\sec \frac{25\pi}{6}$

$$\begin{aligned} 4F) \quad \csc \frac{9\pi}{2} \cdot \frac{180}{\pi} &= \csc 810^\circ \\ &\quad \begin{array}{r} -360 \\ 450 \\ -360 \\ \hline 90 \end{array} \\ &= \csc 90^\circ = \frac{1}{1} = 1 \\ &\quad \frac{1}{1} \end{aligned}$$