

**Learning Goal:** I will determine exact values for trig ratios of special angles.

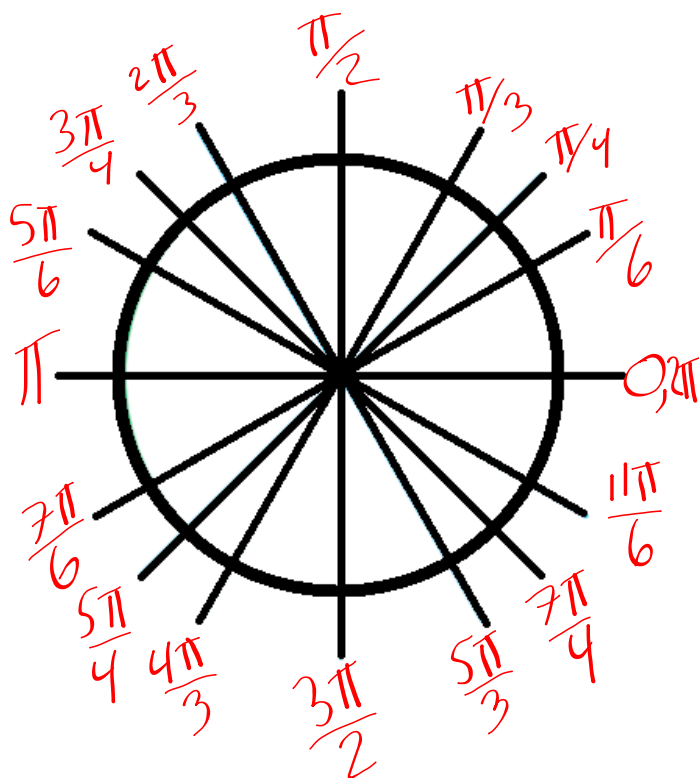
**Minds On:** Special Triangles from grade 11...

**Action:** Note

**Consolidation:** Practice page - finish for homework

## Minds On

## Know Your Radians!



30°	45°	60°	90°
$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
120°	135°	150°	180°
$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	$\pi$
210°	225°	240°	270°
$\frac{7\pi}{6}$	$\frac{5\pi}{4}$	$\frac{4\pi}{3}$	$\frac{3\pi}{2}$
300°	315°	330°	360°
$\frac{5\pi}{3}$	$\frac{7\pi}{4}$	$\frac{11\pi}{6}$	$2\pi$

**Minds On**

## Know Your Radians!

The keys to remember radians are remembering:

$$\frac{\pi}{6}$$

$$\frac{\pi}{4}$$

$$\frac{\pi}{3}$$

$$\frac{\pi}{2}$$

**Minds On**

Know Your Radians!

## Whiteboards

$$\frac{3\pi}{4}$$

Think: is it closer to 1 pi or 2 pi? More or less?

**Minds On**

Know Your Radians!

**Whiteboards**

$$\frac{11\pi}{6}$$

**Minds On**

Know Your Radians!

**Whiteboards**

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

**Minds On**

Know Your Radians!

**Whiteboards**

$$\frac{4\pi}{3}$$

**Minds On**

Know Your Radians!

**Whiteboards**

$$\frac{5\pi}{4}$$



**Minds On**

Know Your Radians!

**Whiteboards**

$$\frac{5\pi}{6}$$

**Minds On**

Know Your Radians!

**Whiteboards**

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

**Minds On**

Know Your Radians!

**Whiteboards**

$$\frac{7\pi}{4}$$

**Minds On**

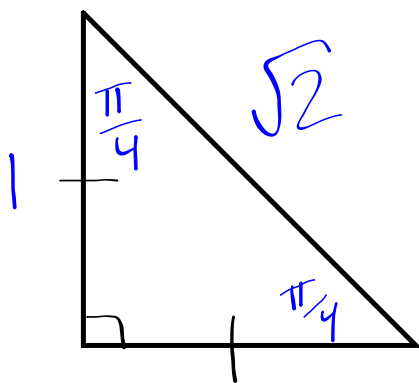
Know Your Radians!

**Whiteboards**

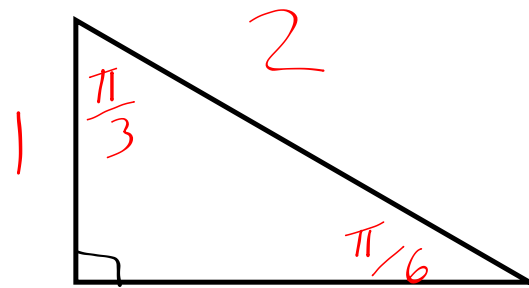
$$\frac{7\pi}{6}$$

**Action****6.2 Radian Measure and Angles on the Cartesian Plane**

**Example 1:** Determine the radian measures of the angles in the special triangles, and calculate their primary trigonometric ratios.



$$\begin{aligned}\sin \frac{\pi}{4} &= \frac{1}{\sqrt{2}} \\ \cos \frac{\pi}{4} &= \frac{1}{\sqrt{2}} \\ \tan \frac{\pi}{4} &= 1\end{aligned}$$

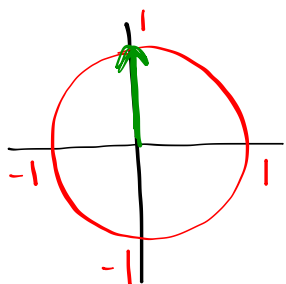


$$\begin{aligned}\sin \frac{\pi}{6} &= \frac{1}{2} \\ \cos \frac{\pi}{6} &= \frac{\sqrt{3}}{2} \\ \tan \frac{\pi}{6} &= \frac{1}{\sqrt{3}}\end{aligned} \quad \left| \quad \begin{aligned}\sin \frac{\pi}{3} &= \frac{\sqrt{3}}{2} \\ \cos \frac{\pi}{3} &= \frac{1}{2} \\ \tan \frac{\pi}{3} &= \sqrt{3}\end{aligned}$$

**Example 2:** Determine the exact value of each trigonometric ratio.

a)  $\sin\left(\frac{\pi}{2}\right)$

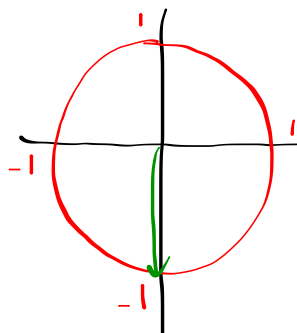
remember:  $\sin\theta = \frac{y}{r}$   
 $= \frac{1}{1} = 1$



unit circle

b)  $\cot\left(\frac{3\pi}{2}\right)$

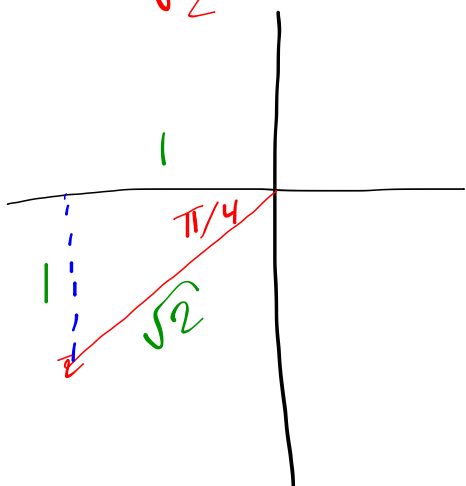
remember:  $\tan\theta = \frac{y}{x}$  so  $\cot\theta = \frac{x}{y}$   
 $= \frac{0}{-1} = 0$



**Example 3:** Determine the exact value of each trigonometric ratio.

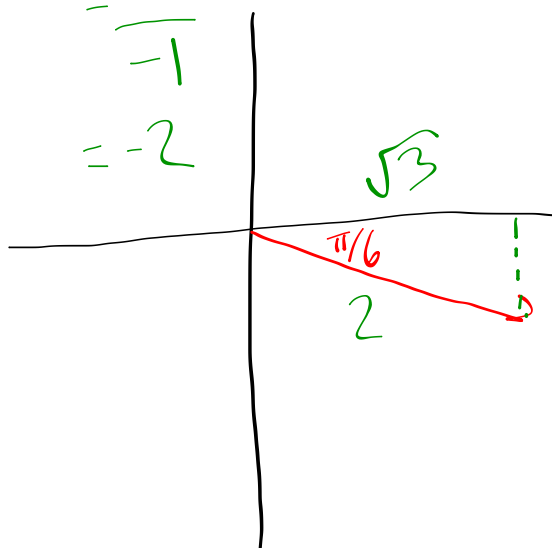
$$\text{a) } \cos\left(\frac{5\pi}{4}\right) \quad \cos \theta = \frac{x}{r}$$

$$= \frac{-1}{\sqrt{2}}$$



$$\text{b) } \csc\left(\frac{11\pi}{6}\right) \quad \csc \theta = \frac{r}{y}$$

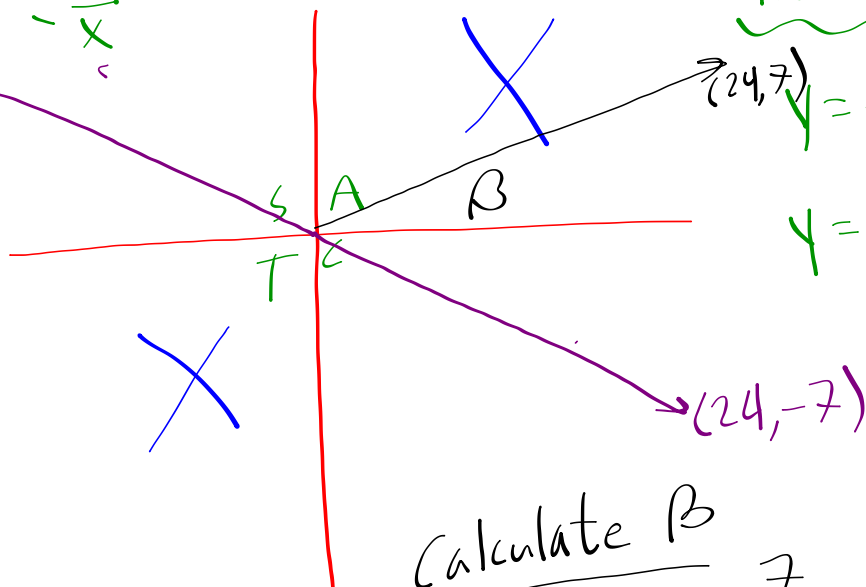
$$= \frac{2}{-1} \\ = -2$$



**Example 4:** If  $\tan\theta = (-\frac{7}{24})$ , where  $0 \leq \theta \leq 2\pi$ , evaluate  $\theta$  to the nearest hundredth.

$$\tan\theta = -\frac{y}{x}$$

$(-24, 7)$



Two cases

$$y = -7, x = 24$$

$$y = 7, x = -24$$

Calculate  $\beta$

$$\tan\beta = \frac{7}{24}$$

$$\beta = \tan^{-1}\left(\frac{7}{24}\right)$$

$$\approx 0.29$$

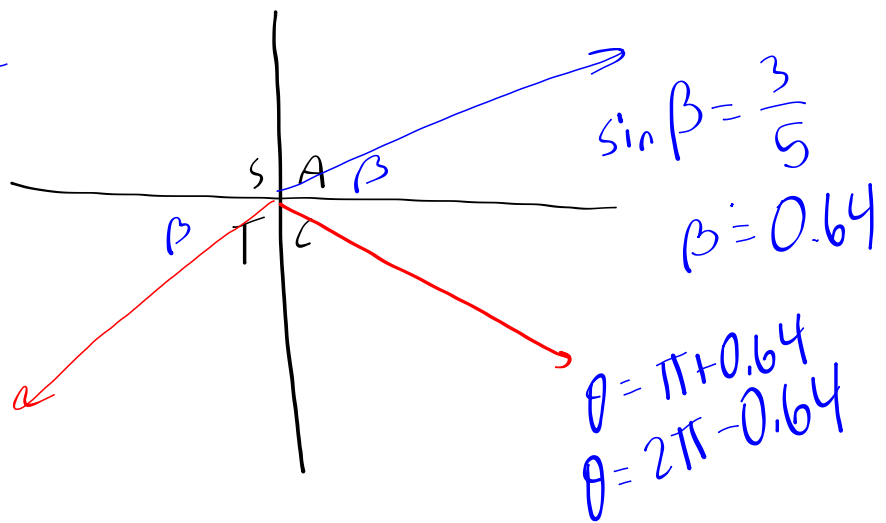
$$\therefore \theta = \pi - 0.29 = 2.95$$

$$\text{and } \theta = 2\pi - 0.29 = 6.00$$

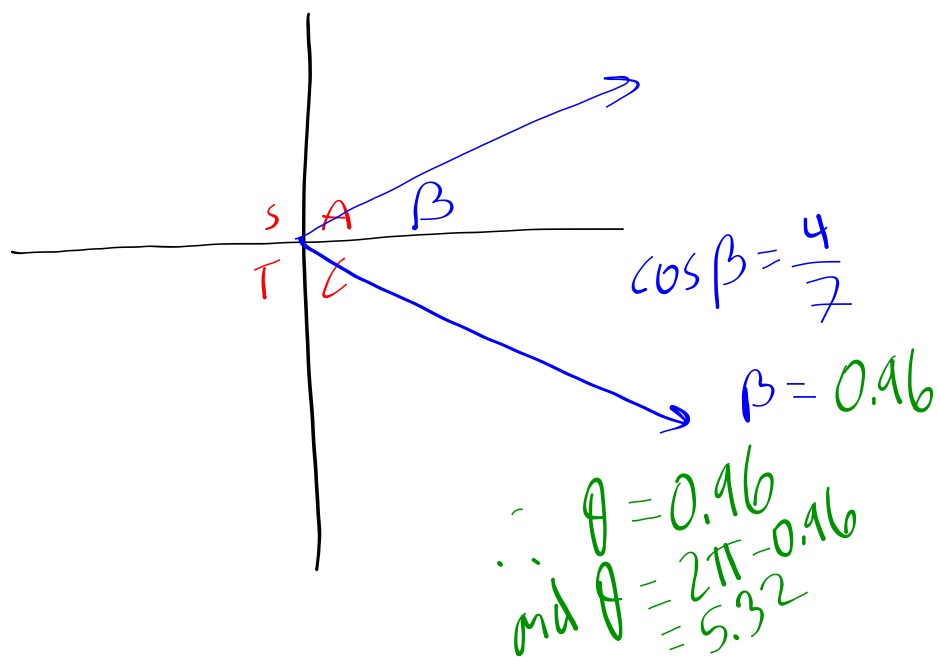


If  $\sin \theta = \frac{-3}{5}$ , where  $0 \leq \theta < 2\pi$   
calculate  $\theta$  to the nearest hundredth.

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



If  $\cos \theta = \frac{4}{7}$ , find  $\theta$ .



**Consolidation**

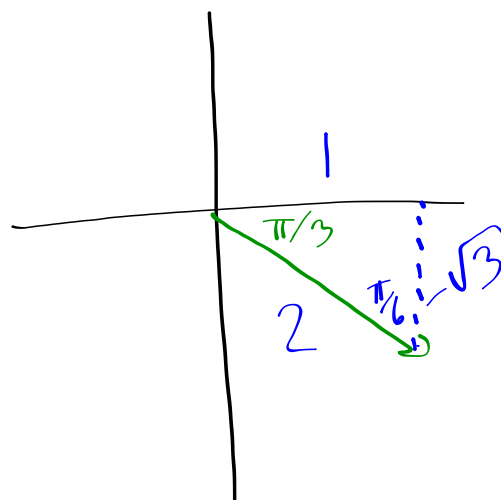
Determine the exact values of the primary trig ratios when

$$\theta = \frac{5\pi}{3}$$

$$\sin \frac{5\pi}{3} = -\frac{\sqrt{3}}{2}$$

$$\cos \frac{5\pi}{3} = \frac{1}{2}$$

$$\tan \frac{5\pi}{3} = -\sqrt{3}$$



Pg. 330

2, 5, 7, 8, 9, 11

\*Switch your calculator to radians!