

## 4.2 Finding Values of Trig Functions w/ the Unit Circle

ex: Find the value of all 6 trig fns. for  $\theta = \frac{7\pi}{6}$ . (leave answers in simplified radical form)

$$\sin \frac{7\pi}{6} = \boxed{-\frac{1}{2}}$$

FLIP  $\rightarrow$

$$\csc \frac{7\pi}{6} = \boxed{-2}$$

$$\cos \frac{7\pi}{6} = \boxed{-\frac{\sqrt{3}}{2}}$$

$$\sec \frac{7\pi}{6} = -\frac{2}{\sqrt{3}} \left( \frac{\sqrt{3}}{\sqrt{3}} \right) = \boxed{-\frac{2\sqrt{3}}{3}}$$

$$\tan \frac{7\pi}{6} = \frac{-\frac{1}{2}}{-\frac{\sqrt{3}}{2}}$$

$$\cot \frac{7\pi}{6} = \boxed{\sqrt{3}}$$

$$= +\frac{1}{2} \cdot +\frac{2}{\sqrt{3}}$$
$$= \boxed{\frac{1}{\sqrt{3}} \left( \frac{\sqrt{3}}{\sqrt{3}} \right) = \frac{\sqrt{3}}{3}}$$

ex: Find the value of all 6 trig fns. for  $\theta = -\frac{5\pi}{4}$ .

$$\sin -\frac{5\pi}{4} = \frac{\sqrt{2}}{2}$$

$$\csc -\frac{5\pi}{4} = \frac{2}{\sqrt{2}} \left( \frac{\sqrt{2}}{\sqrt{2}} \right) = \frac{2\sqrt{2}}{\sqrt{2}} = \sqrt{2}$$

$$\cos -\frac{5\pi}{4} = -\frac{\sqrt{2}}{2}$$

$$\sec -\frac{5\pi}{4} = -\sqrt{2}$$

$$\tan -\frac{5\pi}{4} = -1$$

$$\cot -\frac{5\pi}{4} = -1$$

ex: Use your calculator to find a decimal approximation for:

$$\csc \frac{5\pi}{12} = \frac{1}{\sin \frac{5\pi}{12}} = \boxed{1.035}$$

$$\sec \frac{5\pi}{12} = \frac{1}{\cos \frac{5\pi}{12}} = \boxed{3.864}$$

$$\cot \frac{5\pi}{12} = \frac{1}{\tan \frac{5\pi}{12}} = \boxed{.268}$$

Radian Mode

ex: Evaluate  $\sin \left( -\frac{11\pi}{2} \right)$  ← Find a coterminal  $\angle$  on the unit circle

$$-\frac{11\pi}{2} + \frac{2\pi}{1} \left( \frac{2}{2} \right)$$

$$-\frac{11\pi}{2} + \frac{4\pi}{2} + \frac{4\pi}{2} + \frac{4\pi}{2} = \frac{\pi}{2}$$

$$\sin -\frac{11\pi}{2} = \sin \frac{\pi}{2} = \boxed{1}$$