

## Lesson 3 Special Angles

1. Determine the exact primary trigonometric ratios for each angle in standard position.

coords  
 $(-\frac{1}{2}, -\frac{\sqrt{3}}{2})$   
 $\cos \theta, \sin \theta$

a)  $240^\circ$

$$\cos 240^\circ = -\frac{1}{2}$$

$$\sin 240^\circ = -\frac{\sqrt{3}}{2}$$

$$\tan 240^\circ = \sqrt{3}$$

$$\hookrightarrow \frac{\sin 240^\circ}{\cos 240^\circ} = \frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}}$$

$$\frac{-\sqrt{3}}{1} = (-\sqrt{3})$$

b)  $360^\circ$

$$\cos 360^\circ = 1$$

$$\sin 360^\circ = 0$$

$$\tan 360^\circ = 0$$

$(1, 0)$

\* on the unit circle

$$\cos \theta = x$$

$$\sin \theta = y$$

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

c)  $150^\circ$

$$\cos 150^\circ = -\frac{\sqrt{3}}{2}$$

$$\sin 150^\circ = \frac{1}{2}$$

$$\tan 150^\circ = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$$

d)  $210^\circ$

$$\cos 210^\circ = -\frac{\sqrt{3}}{2}$$

$$\sin 210^\circ = -\frac{1}{2}$$

$$\tan 210^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

2. Determine possible coordinates of a terminal point for each angle in standard position.

a)  $135^\circ$

$$\left(-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$$

b)  $300^\circ$

$$\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$$

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3. Determine the angles which satisfy each equation.

a.)  $\sin\theta = -\frac{\sqrt{3}}{2}$

look for y values of  $-\frac{\sqrt{3}}{2}$

$\theta = 240^\circ, 300^\circ$

$\sin\theta < 0$  in QIII, IV

b.)  $\cos\theta = \frac{1}{\sqrt{2}}$

look for x values of  $\frac{\sqrt{2}}{2}$  or  $\frac{\sqrt{2}}{2}$

$\theta = 45^\circ, 315^\circ$

$\cos\theta > 0$  in QI, IV

c.)  $\tan\theta = 1$

$\sin\theta$  and  $\cos\theta$  are the same

$\theta = 45^\circ, 225^\circ$

d.)  $\sin\theta = 0$

$\theta = 0^\circ, 180^\circ, 360^\circ$

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# 3 a, c, e, g, i, k, m, o  
4 a, c, e, f, j, l  
6 a, c, e, h