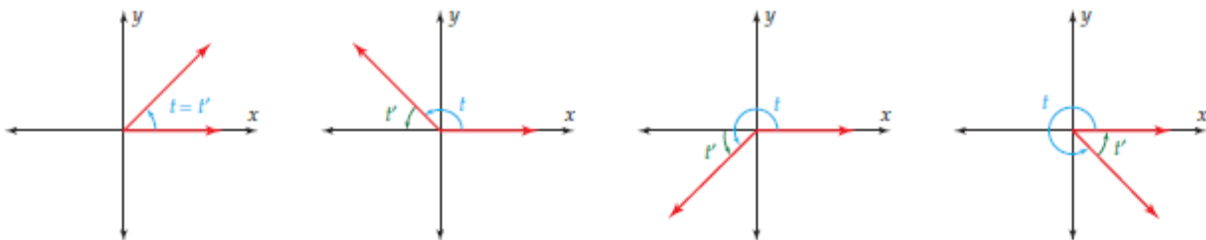


## Off-Site Instruction Packet Day 7

### 6-4 Day 2     Trigonometric Functions

#### Reference Angles

For an angle  $\theta$  in standard position, the *reference angle* is the \_\_\_\_\_ *positive acute angle* \_\_\_\_\_ formed by the terminal side of  $\theta$  and the  $x$ -axis.



#### Finding Trigonometric Function Values

To find the sine, cosine, or tangent of  $t$  radians,

- Sketch an angle of  $t$  radians in standard position and determine the quadrant in which the terminal side lies
- Find the reference angle which has measure  $t'$  radians
- Find the sine, cosine, and tangent of  $t'$  and append the approximate sign

#### Example 3: Using Reference Angles

Use reference angles to find the exact value of  $\sin t$ ,  $\cos t$ , and  $\tan t$ .

a)  $t = \frac{3\pi}{4}$  ( $135^\circ$ )

$$\sin \frac{3\pi}{4} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\cos \frac{3\pi}{4} = \frac{-1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$$

$$\tan \frac{3\pi}{4} = \frac{1}{-1} = -1$$

b)  $t = \frac{4\pi}{3}$  ( $240^\circ$ )

$$\sin \frac{4\pi}{3} = \frac{-\sqrt{3}}{2}$$

$$\cos \frac{4\pi}{3} = \frac{-1}{2}$$

$$\tan \frac{4\pi}{3} = \frac{-\sqrt{3}}{-1} = \sqrt{3}$$

c)  $t = \frac{11\pi}{6}$  ( $330^\circ$ )

$$\sin \frac{11\pi}{6} = \frac{-1}{2}$$

$$\cos \frac{11\pi}{6} = \frac{\sqrt{3}}{2}$$

$$\tan \frac{11\pi}{6} = \frac{-1}{\sqrt{3}} = \frac{-\sqrt{3}}{3}$$

#### Trigonometric Ratios of Coterminal Angles

Any trigonometric function of real number  $t$  is equal to the same trigonometric functions of all numbers  $\underline{t \pm 2k\pi}$ , where  $k$  is an integer.

Example 4: **Trigonometric Functions where  $t > 2\pi$**

Find the sine, cosine, and tangent of  $\frac{7\pi}{3}$

$$\sin \frac{7\pi}{3} = \frac{\sqrt{3}}{2}$$

$$\cos \frac{7\pi}{3} = \frac{1}{2}$$

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

Assessment:

Pg 452 #25-51 (odd)