

Trigonometry Review



Old Trig Review

Trig Functions

• $\sin(x)$
sine

• $\cos(x)$
cosine

• $\tan(x)$
tangent

Reciprocal Trig Functions

• $\csc(x) = \frac{1}{\sin(x)}$

cosecant

• $\sec(x) = \frac{1}{\cos(x)}$

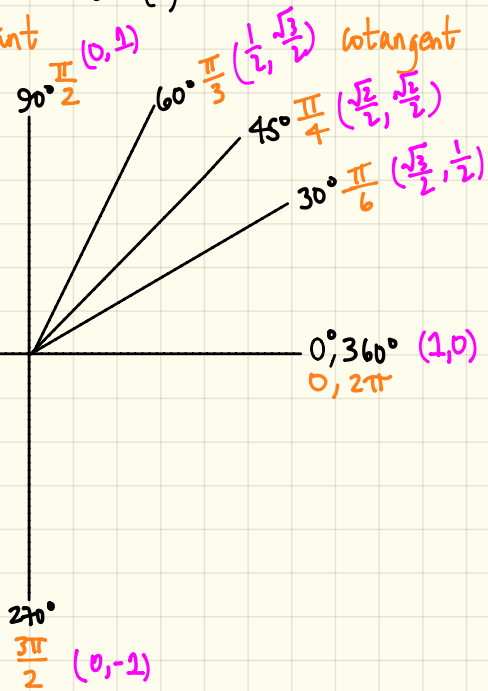
secant

• $\cot(x) = \frac{1}{\tan(x)}$

cotangent

Unit Circle
(x, y)
(cos x, sin x)

(-1, 0) π 180°



Converting from Radians to Degrees:

multiply by $\frac{180^\circ}{\pi}$

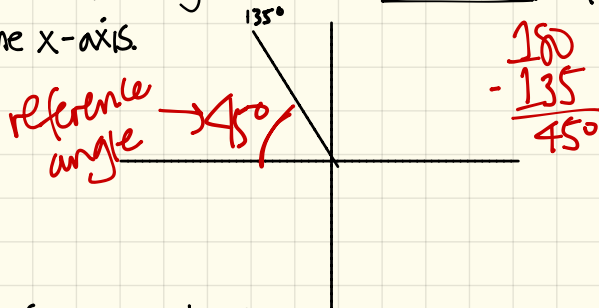
Converting from Degrees to Radians:

multiply by $\frac{\pi}{180^\circ}$

Trig Chart - memorize

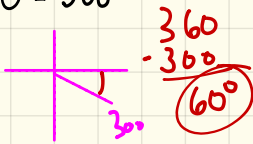
Degrees	Radians	$\sin \theta$	$\cos \theta$
0°	$0, \pi$	0	$\frac{\sqrt{4}}{2} = 1$
30°	$\frac{\pi}{6}$	$\frac{\sqrt{1}}{2} = \frac{1}{2}$	$\frac{\sqrt{3}}{2}$
45°	$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$
60°	$\frac{\pi}{3}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{1}}{2} = \frac{1}{2}$
90°	$\frac{\pi}{2}$	$\frac{\sqrt{4}}{2} = 1$	0

Reference angle is the smallest angle that the terminal side of a given angle makes with the x-axis.

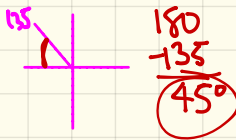


[Examples] Find the reference angle for each angle.

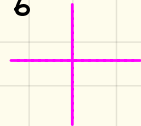
① $\theta = 300^\circ$



② $\theta = 135^\circ$



③ $\theta = \frac{7\pi}{6}$



④ $\theta = \frac{\pi}{4}$

⑤ $\theta = -\frac{5\pi}{3}$

⑥ $\theta = -\frac{5\pi}{4}$

[Examples] Compute the exact values of each trig function.

$$\textcircled{1} \tan\left(\frac{3\pi}{4}\right)$$

$$= \tan(135^\circ)$$

$$= -\tan(45^\circ)$$

$$= \frac{\sin(45^\circ)}{-\cos(45^\circ)}$$

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

$$= \frac{\sqrt{2}}{2} \cdot \frac{2}{\sqrt{2}}$$

$$\textcircled{-1}$$



$$\textcircled{2} \cos\left(\frac{7\pi}{6}\right)$$

$$= \cos(210^\circ)$$

$$= -\cos(30^\circ)$$

$$= \textcircled{-\frac{\sqrt{3}}{2}}$$

$$\textcircled{3} \sin(-30^\circ)$$

$$= \sin(300^\circ)$$

$$= \sin(30^\circ)$$

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

$$\textcircled{4} \sin(-30^\circ)$$

$$\textcircled{5} \sin(240^\circ)$$

$$= -\sin(60^\circ)$$

$$= \textcircled{-\frac{\sqrt{3}}{2}}$$

$$\textcircled{6} \sin\left(\frac{5\pi}{6}\right)$$

$$= \sin(150^\circ)$$

$$= -\sin(30^\circ)$$

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

$$\textcircled{7} \cos\left(\frac{3\pi}{6}\right)$$

$$= \cos(90^\circ)$$

$$= \cos(30^\circ)$$

$$= \frac{\sqrt{3}}{2}$$

$$\textcircled{8} \cos\left(\frac{2\pi}{3}\right)$$

$$= \cos(120^\circ)$$

$$= \cos(60^\circ)$$

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

$$\textcircled{9} \sin\left(\frac{23\pi}{4}\right)$$

$$= \sin(1035^\circ)$$

$$= \sin(315^\circ)$$

$$= \sin(45^\circ)$$

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