

Trig Identities

Reciprocal Identities

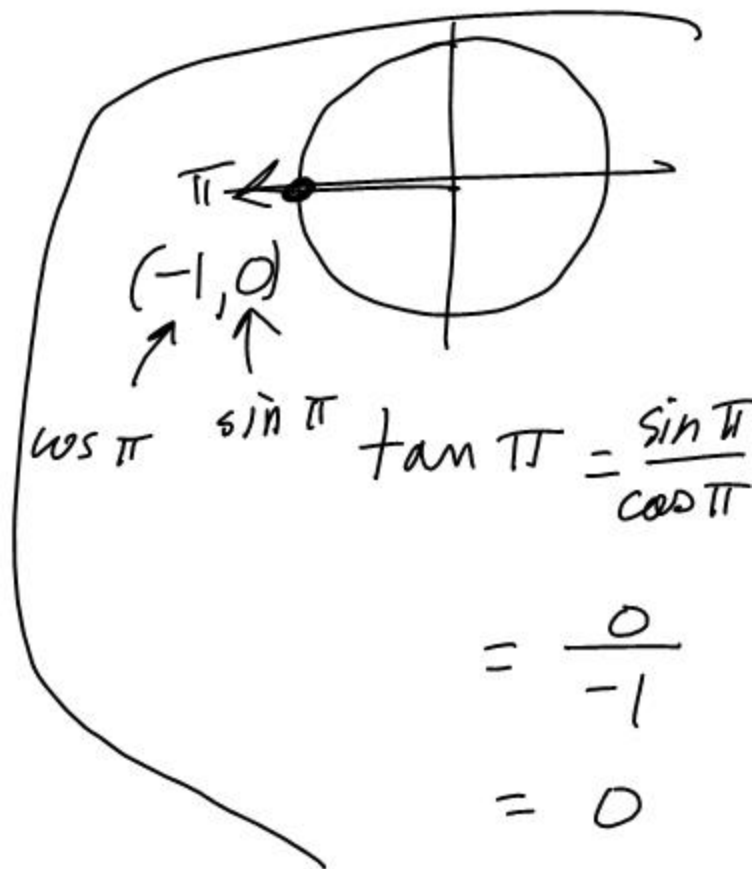
$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta}$$

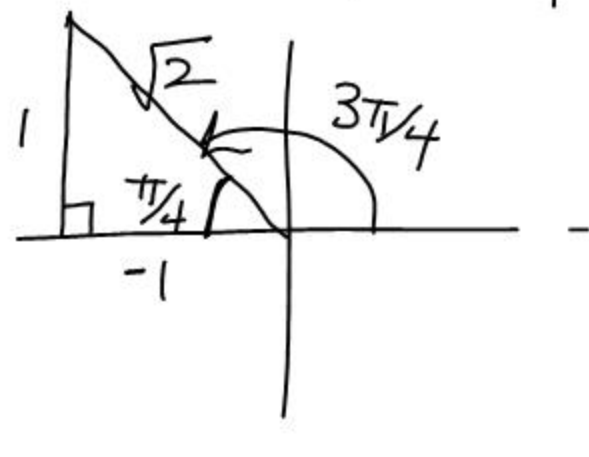
$$= \frac{1}{\tan \theta}$$

$$\sec \theta = \frac{1}{\cos \theta}$$

$$\csc \theta = \frac{1}{\sin \theta}$$



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



Cofunction Identities

$$\sin \theta = \cos \left(\frac{\pi}{2} - \theta \right)$$

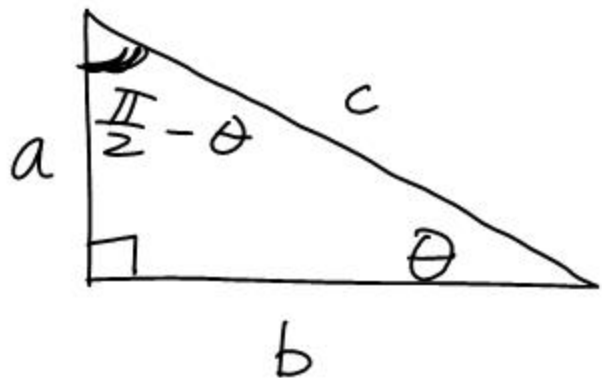
$$\cos \theta = \sin \left(\frac{\pi}{2} - \theta \right)$$

$$\tan \theta = \cot \left(\frac{\pi}{2} - \theta \right)$$

$$\cot \theta = \tan \left(\frac{\pi}{2} - \theta \right)$$

$$\sec \theta = \csc \left(\frac{\pi}{2} - \theta \right)$$

$$\csc \theta = \sec \left(\frac{\pi}{2} - \theta \right)$$



$$\sin \theta = \frac{a}{c}$$

$$\cos \left(\frac{\pi}{2} - \theta \right) = \frac{a}{c}$$

complement
of θ

Ex $\sin 30^\circ$

$$\frac{1}{2} \quad \checkmark$$

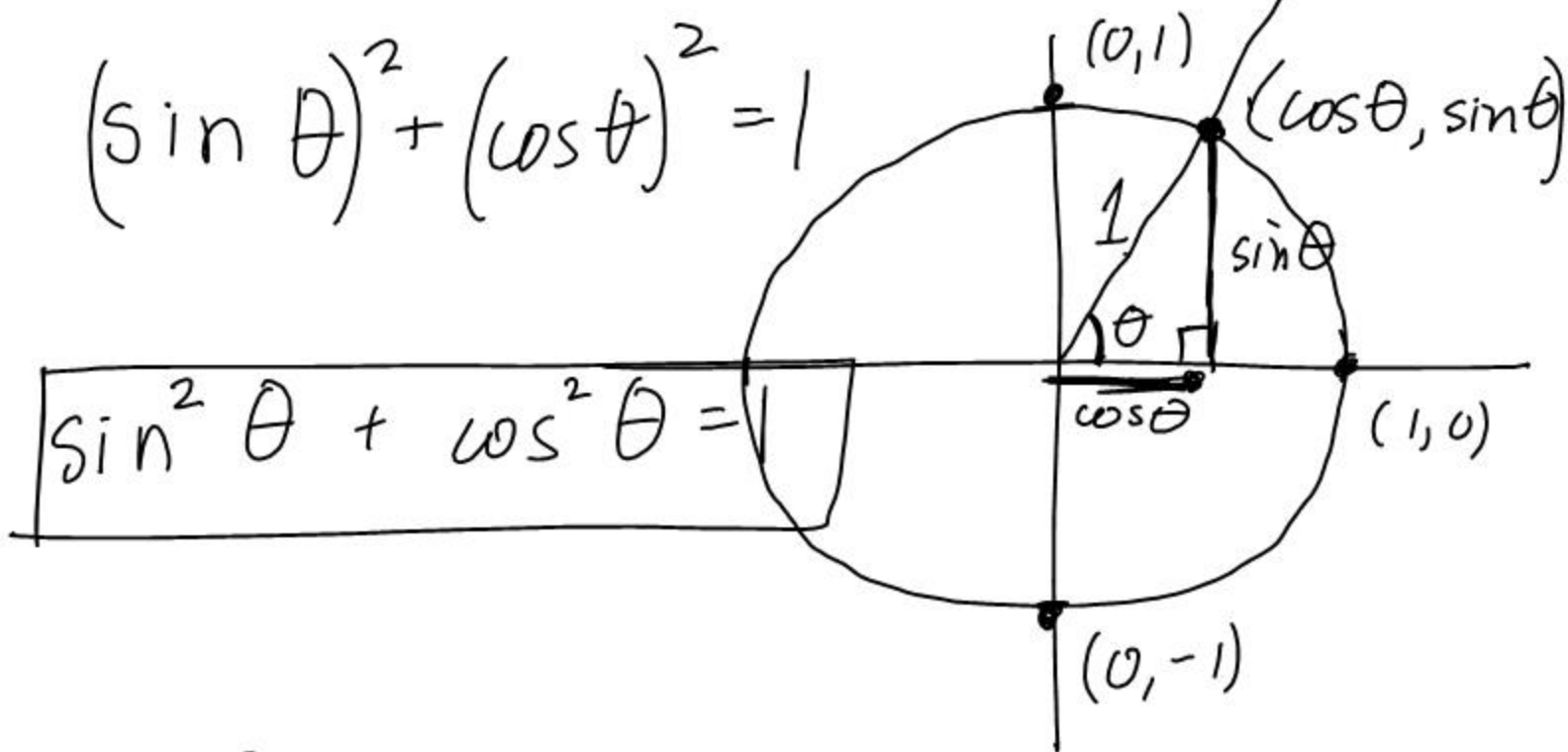
$$\cos (90^\circ - 30^\circ)$$

$$= \cos 60^\circ$$

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

Pythagorean Identities

$$(\sin \theta)^2 + (\cos \theta)^2 = 1$$



$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\frac{\cos^2 \theta}{\cos^2 \theta} + \frac{\cos^2 \theta}{\cos^2 \theta} = \frac{\cos^2 \theta}{\cos^2 \theta}$$

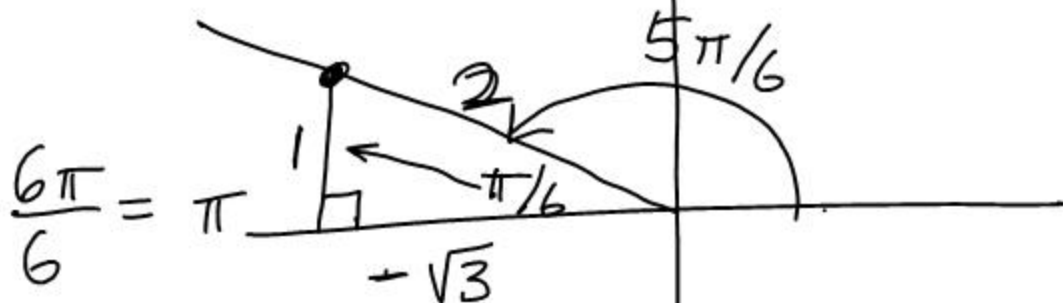
$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$\frac{\sin^2 \theta}{\sin^2 \theta} + \frac{\cos^2 \theta}{\sin^2 \theta} = \frac{1}{\sin^2 \theta}$$

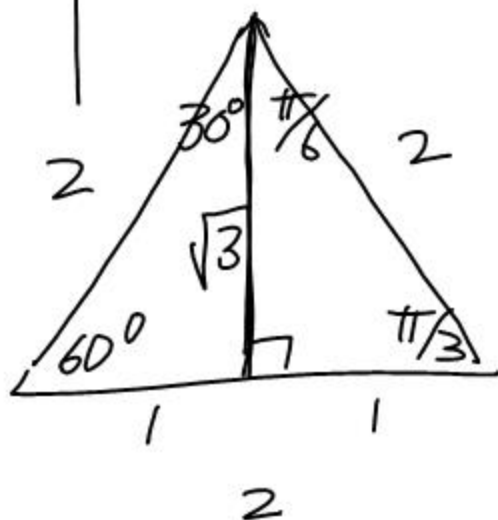
$$1 + \cot^2 \theta = \csc^2 \theta$$

EX. $\sin^2 \frac{5\pi}{6} + \cos^2 \frac{5\pi}{6}$

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



$\frac{1}{4} + \frac{3}{4} = 1$



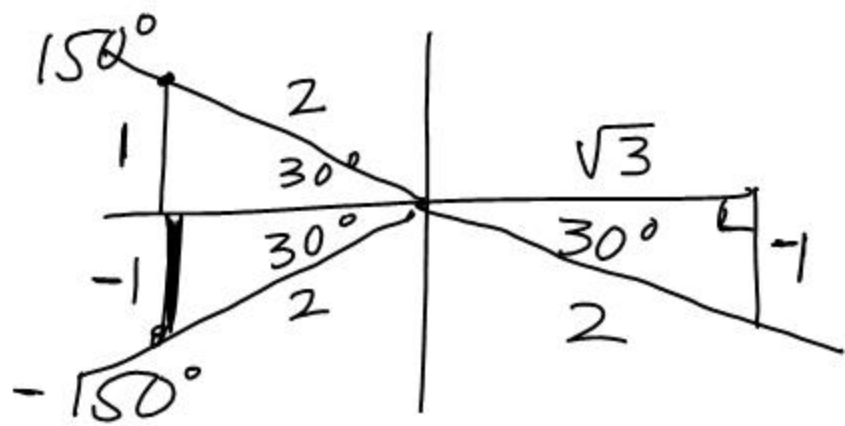
Odd and Even Identities

$$\sin 30^\circ = \frac{1}{2}$$

$$\sin(-30^\circ) = -\frac{1}{2}$$

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

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



$$-\sin \theta = \sin(-\theta)$$

sine is
an odd
function

$$-f(x) = f(-x)$$

Exercises

$$\textcircled{1} \quad \sin^2 \frac{3\pi}{4} + \cos^2 \frac{3\pi}{4}$$

$$\textcircled{2} \quad \tan^2 \frac{7\pi}{6} - \sec^2 \frac{7\pi}{6}$$

$$\textcircled{3} \quad \cot^2 \frac{2\pi}{3} - \csc^2 \frac{2\pi}{3}$$
