

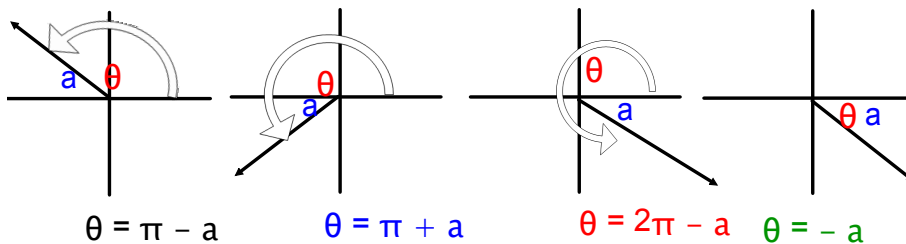
MHF 4UI UNIT 6

Trigonometric Functions II

Day 1 - Trig Identities (Part I)



Review: Related Angles:

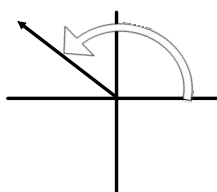


Using CAST Rule :

$\sin(\pi - a) = \sin a$ $\sin(\pi + a) = -\sin a$ $\sin(2\pi - a) = -\sin a$
 $\cos(\pi - a) = -\cos a$ $\cos(\pi + a) = -\cos a$ $\cos(2\pi - a) = \cos a$
 $\tan(\pi - a) = -\tan a$ $\tan(\pi + a) = \tan a$ $\tan(2\pi - a) = -\tan a$

Example 1: Find the exact value of the following:

$$\sin \frac{2\pi}{3}$$

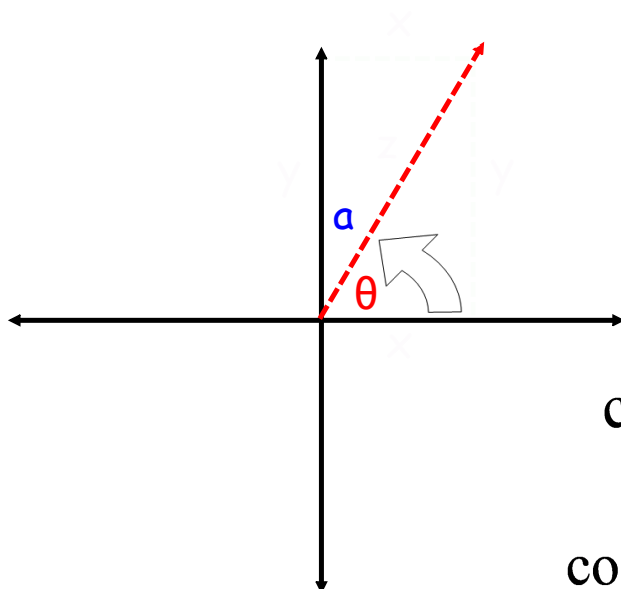


Example 2: If $\tan \theta = -\frac{1}{\sqrt{3}}$ and $\frac{\pi}{2} \leq \theta \leq \pi$, find θ .

Example 3: Simplify: $\cos(\pi - x) - \cos(-x) + \sin(\pi + x) + \sin(2\pi - x)$

Co - Related Angles

(These angles are related to the **y axis!!!**)



$$\theta = \frac{\pi}{2} - a$$

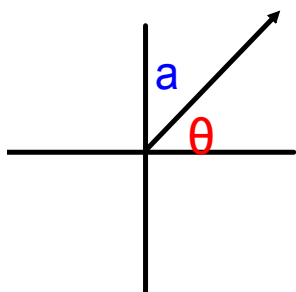
$$\cos \theta = \frac{x}{z}$$

$$\sin a = \frac{x}{z}$$

$$\cos \left(\frac{\pi}{2} - a \right) = \frac{x}{z}$$

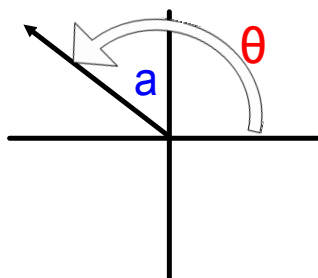
$$\therefore \cos \left(\frac{\pi}{2} - a \right) = \sin a$$

Co - Related Angles



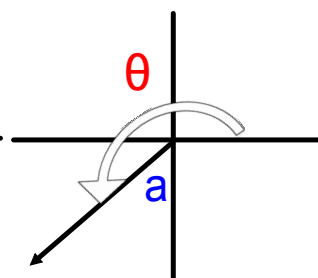
$$\theta = \pi/2 - a$$

$$\begin{aligned} \sin(\pi/2 - a) &= \cos a \\ \cos(\pi/2 - a) &= \sin a \\ \tan(\pi/2 - a) &= \cot a \end{aligned}$$



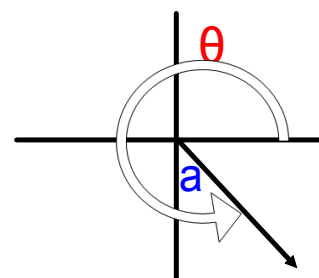
$$\theta = \pi/2 + a$$

$$\begin{aligned} \sin(\pi/2 + a) &= \cos a \\ \cos(\pi/2 + a) &= -\sin a \\ \tan(\pi/2 + a) &= -\cot a \end{aligned}$$



$$\theta = 3\pi/2 - a$$

$$\begin{aligned} \sin(3\pi/2 - a) &= -\cos a \\ \cos(3\pi/2 - a) &= -\sin a \\ \tan(3\pi/2 - a) &= \cot a \end{aligned}$$



$$\theta = 3\pi/2 + a$$

$$\begin{aligned} \sin(3\pi/2 + a) &= -\cos a \\ \cos(3\pi/2 + a) &= \sin a \\ \tan(3\pi/2 + a) &= -\cot a \end{aligned}$$

Example 3: Express $\cos\left(-\frac{4\pi}{3}\right)$ as a co-related angle, then evaluate.