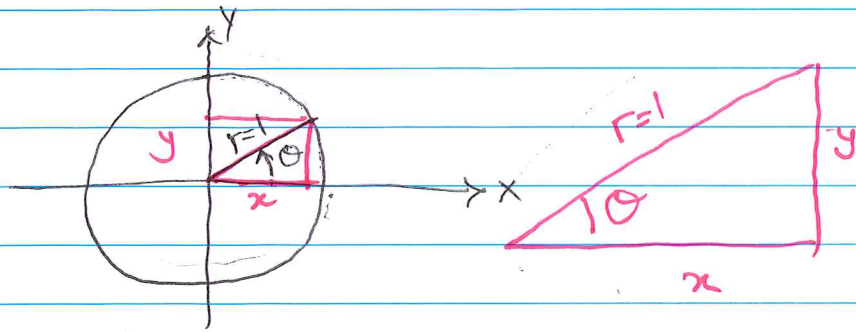


- evaluating trig functions on $[0, \pi/2] \rightarrow [0, 2\pi]$



Soh CAH TOA

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

$$\underline{\sin \theta = y}$$

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

$$\underline{\cos \theta = x}$$

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

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

$$x^2 + y^2 = r^2$$

$$(\cos \theta)^2 + (\sin \theta)^2 = 1^2 \rightarrow \boxed{\cos^2 \theta + \sin^2 \theta = 1}$$

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

divide by $\cos^2 \theta$

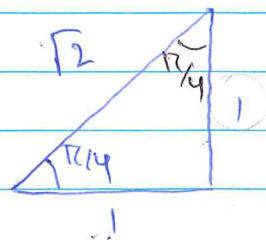
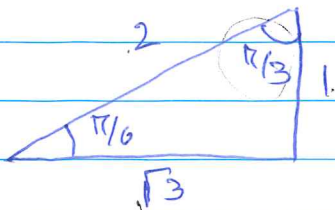
$$\frac{\cos^2 \theta}{\cos^2 \theta} + \frac{\sin^2 \theta}{\cos^2 \theta} = \frac{1}{\cos^2 \theta}$$

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

$$\underline{1 + \tan^2 \theta = \sec^2 \theta}$$

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

divide by $\sin^2 \theta$?



$$\sin(\pi/6) = \frac{1}{2}$$

$$\cos(\pi/6) = \frac{\sqrt{3}}{2}$$

$$\sin(\pi/3) = \frac{\sqrt{3}}{2}$$

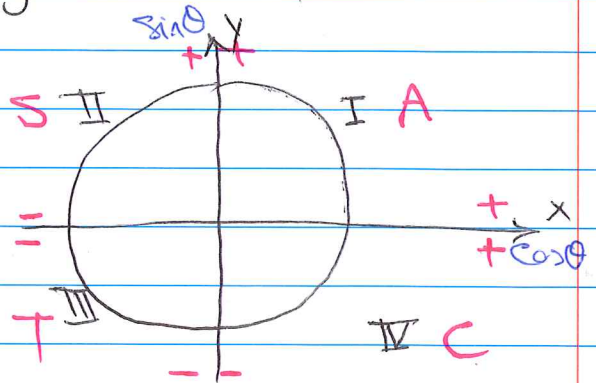
$$\cos(\pi/3) = \frac{1}{2}$$

$$\sin(\pi/4) = \frac{1}{\sqrt{2}}$$

$$\cos(\pi/4) = \frac{1}{\sqrt{2}}$$

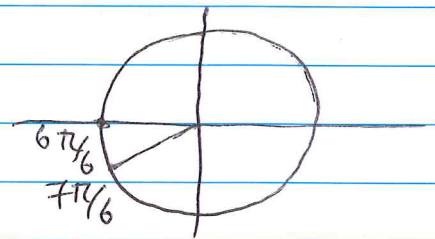
$$\sin\left(\frac{7\pi}{6}\right) = ?$$

CAST tells where which trig function is +



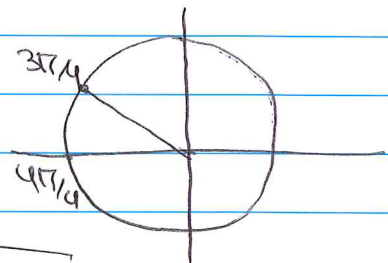
$$\sin\left(\frac{7\pi}{6}\right) = -\sin\left(\frac{\pi}{6}\right)$$

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



$$\cos\left(\frac{3\pi}{4}\right) = -\cos\left(\frac{\pi}{4}\right)$$

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



$$\sin(x+y) = \sin x \cos y + \sin y \cos x$$

$$\sin(x-y) = ?$$

$$\sin\left(\frac{7\pi}{6}\right) = \sin\left(\pi + \frac{\pi}{6}\right)$$

$$= \sin(\pi) \cdot \cos\left(\frac{\pi}{6}\right) + \sin\left(\frac{\pi}{6}\right) \cdot \cos(\pi)$$

$$= (0) \cdot \frac{\sqrt{3}}{2} + \frac{1}{2} \cdot (-1)$$

$$= 0 + (-\frac{1}{2})$$

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

- $\boxed{\cos(x+y) = \cos x \cos y - \sin x \sin y}$ $\cos(x-y) = ?$

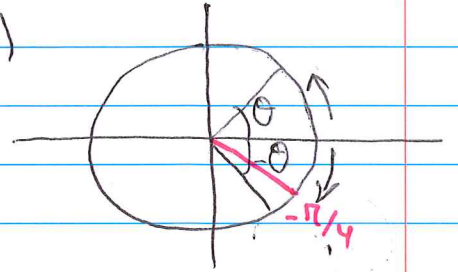
$$\cos\left(\frac{3\pi}{4}\right) = \cos\left(\pi - \frac{\pi}{4}\right) = \cos\left(\pi + \left(-\frac{\pi}{4}\right)\right)$$

$$= \cos(\pi) \cdot \cos\left(-\frac{\pi}{4}\right) - \sin(\pi) \cdot \sin\left(-\frac{\pi}{4}\right)$$

$$= (-1) \cdot \frac{1}{\sqrt{2}} - (0) \cdot \left(-\frac{1}{\sqrt{2}}\right)$$

$$= -\frac{1}{\sqrt{2}} = 0$$

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



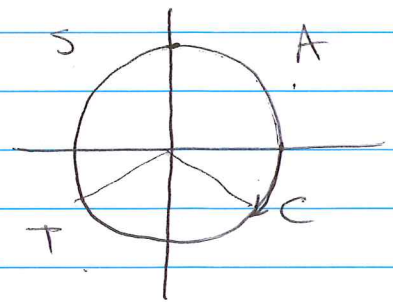
- inverse of trig functions:

$$\sin(x) = -\frac{\sqrt{3}}{2}$$

$$x = \text{Arcsin}\left(-\frac{\sqrt{3}}{2}\right) = \sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$$

in Quadrant III & IV sine is negative

$$\sin\left(\frac{\pi}{3}\right) = \frac{\sqrt{3}}{2}$$



in III quadrant $x = \pi + \frac{\pi}{3} = \frac{4\pi}{3}$

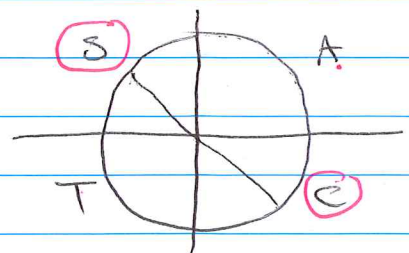
in IV quadrant $x = 2\pi - \frac{\pi}{3} = \frac{5\pi}{3}$

$$\tan(x) = -1$$

$$x = \text{Arc tan}(-1)$$

in II quadrant

in IV quadrant



$$\tan(\pi/4) = 1$$

$$\text{II. } x = \pi - \pi/4 = 3\pi/4$$

$$\text{IV. } x = 2\pi - \pi/4 = 7\pi/4$$

- Period & Amplitude of trig function

$$a + b \sin(cx + d)$$

$$\text{Period} = \frac{2\pi}{c}$$

$$\text{Amplitude} = b$$

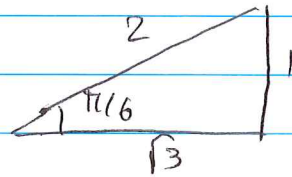
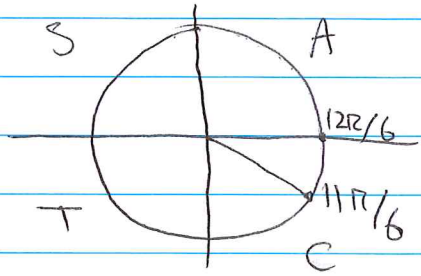
$$\text{Phase shift} = d/c$$

$$\text{Average} = a$$

Kahoot.it

$$\#1. \cos\left(\frac{11\pi}{6}\right) = +\cos\left(\frac{\pi}{6}\right)$$

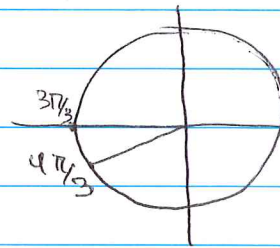
$$= +\frac{\sqrt{3}}{2}$$



$$\#2. \sin\left(\frac{8\pi}{6}\right) = \sin\left(\frac{4\pi}{3}\right)$$

$$= -\sin\left(\frac{\pi}{3}\right)$$

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



$$\#3. \sin^2 x + \cos^2 x = 1$$

$$1 + \frac{\cos^2 x}{\sin^2 x} = \frac{1}{\sin^2 x} \rightarrow \underline{1 + \cot^2 x = \csc^2 x}$$

$$\#4. \cos(\operatorname{Arccos}(-1/2)) = -\frac{1}{2}$$

$$\#5. P = \frac{2R}{4} = R/2$$

$$A = |-\delta| = 6$$