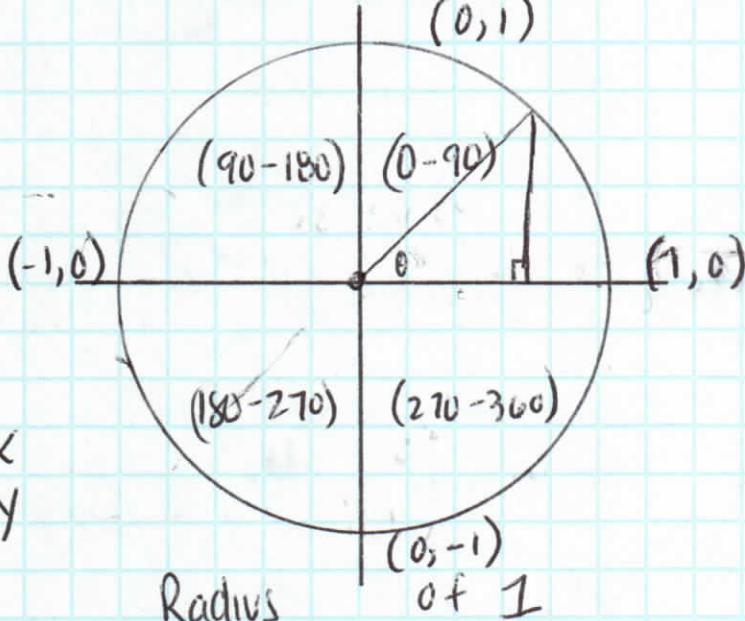


Solving Trigonometric Equations

UNIT Circle
(0,1)



$$\cos = x$$

$$\sin = y$$

Trigonometric Values of Special Angles

	30	45	60
Sin	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
cos	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$
tan	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$

$$\tan = \frac{\sin}{\cos} \rightarrow \frac{\text{opp}}{\text{hyp}} \div \frac{\text{adj}}{\text{hyp}} = \frac{\text{opp}}{\text{hyp}} \cdot \frac{\text{hyp}}{\text{adj}} = \frac{\text{opp}}{\text{adj}}$$

Reference Angle Rules

- Q₁ $\theta = \theta$
- Q₂ $180 - \theta$
- Q₃ $\theta - 180$
- Q₄ $360 - \theta$

sin/csc +	sin/csc +
cos/sec -	cos/sec +
tan/cot -	tan/cot +

sin/csc -	sin/csc -
cos/sec -	cos/sec +
tan/cot +	tan/cot -

Example 1

Find the exact value of $\cos 330^\circ$

Q₄ pos $360 - 330$
 30

$$\cos 30 = \frac{\sqrt{3}}{2} \rightarrow \cos 330 = \frac{\sqrt{3}}{2}$$

Example 2

Find the exact value of $\sin 240$.

Q₃ neg $240 - 180$
 60

$$\sin 60 = \frac{\sqrt{3}}{2} \rightarrow \sin 240 = -\frac{\sqrt{3}}{2}$$

Example 3

Find the exact value of $\cos \frac{5\pi}{3}$

$$\frac{5\pi}{3} \cdot \frac{180}{\pi} = \frac{900}{3} = 300$$

$\cos 300$ Q4 pos $360 - 300$
60

$$\cos 60 = \frac{1}{2} \rightarrow \cos \frac{5\pi}{3} = \frac{1}{2}$$

Homework

1) $\tan \frac{5\pi}{4}$

2) $\cos -\frac{2\pi}{3}$

3) $\sin \frac{7\pi}{6}$