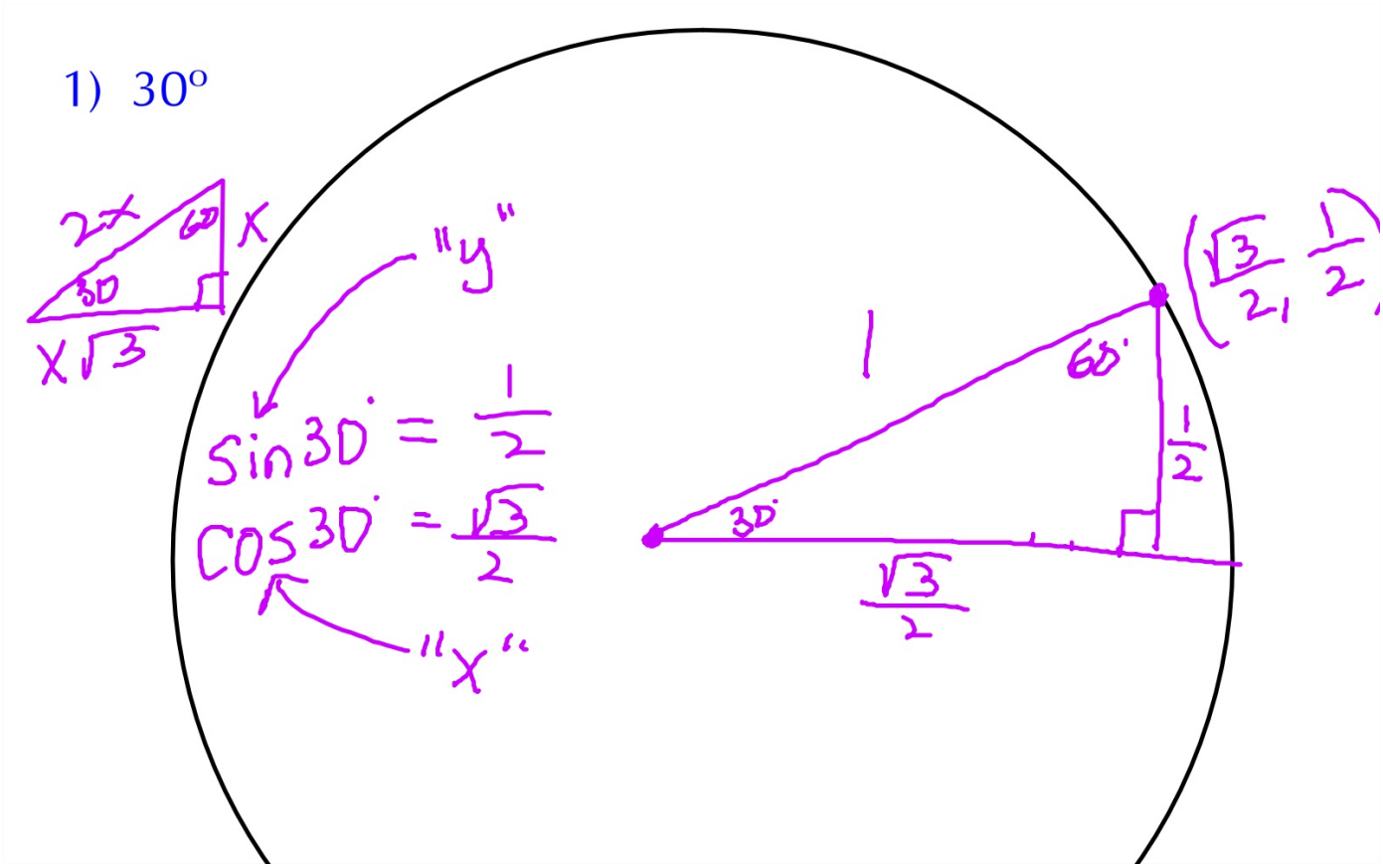
9.3: Evaluating values of trigonometric functions

1) 30°

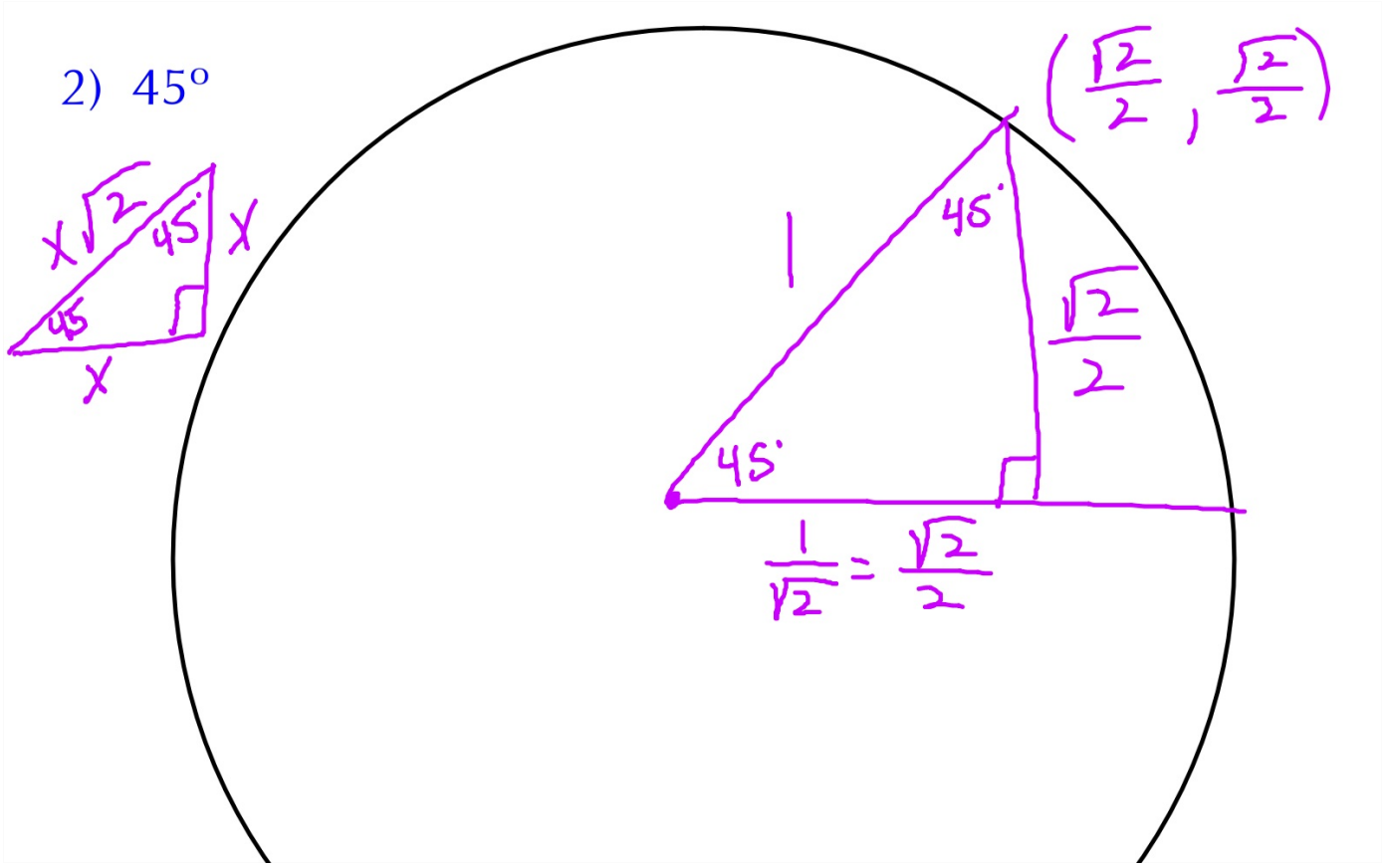


For each coordinate of the unit circle, because of SOH CAH TOA, the

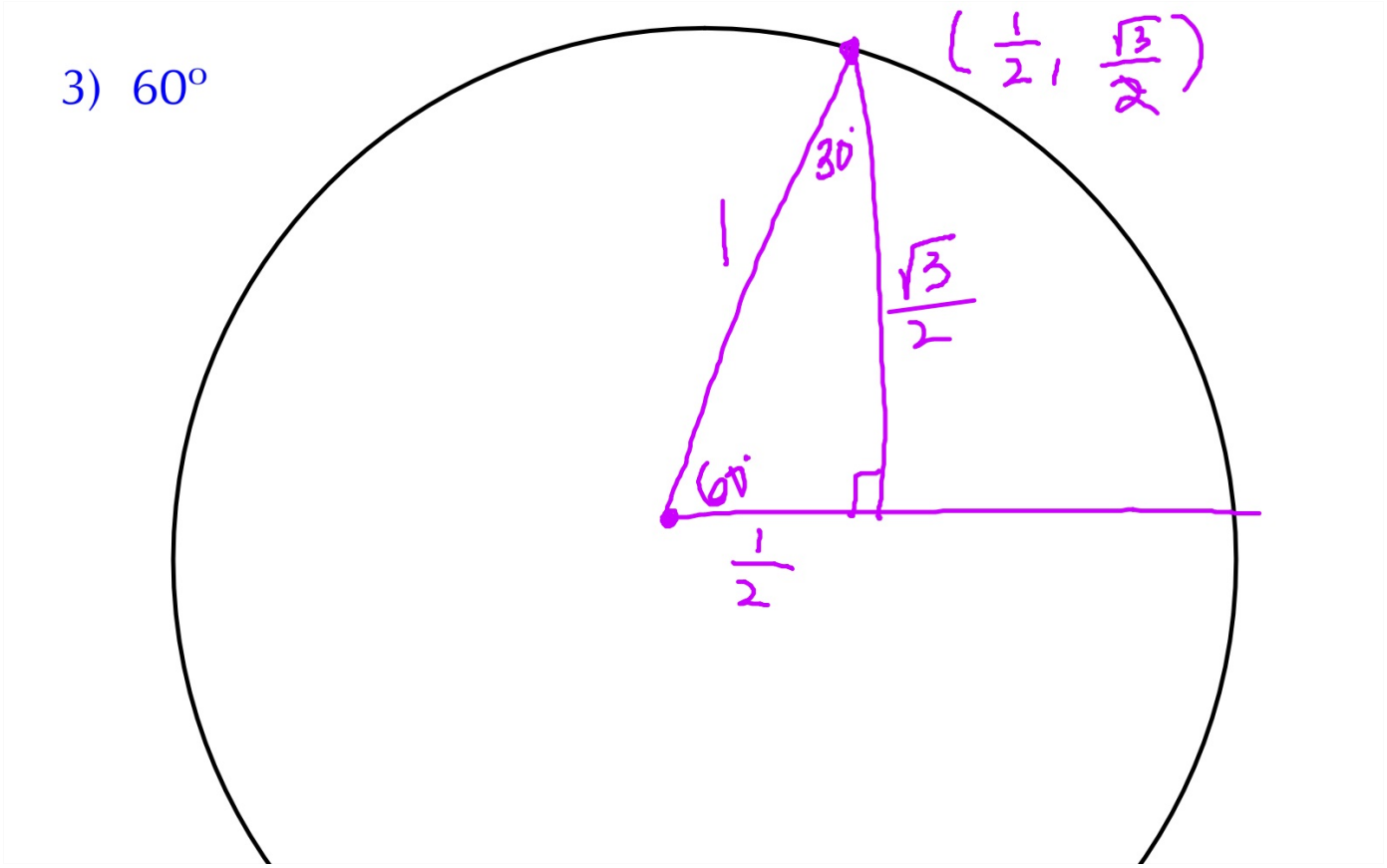
x-coordinate corresponds to cosine

y-coordinate corresponds to sine

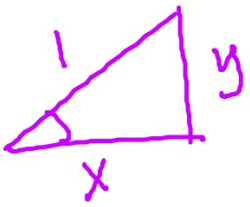
2) 45°

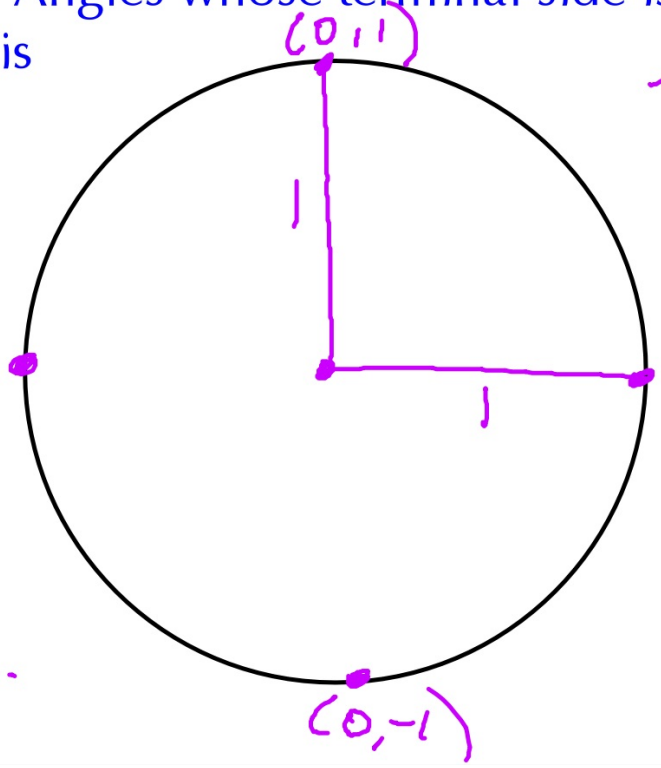

$x\sqrt{2}$
45°
x
45°
x
$\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$
1
45°
$\frac{\sqrt{2}}{2}$
45°
$\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

3) 60°



Quadrantals: Angles whose terminal side is on the x-axis or y-axis



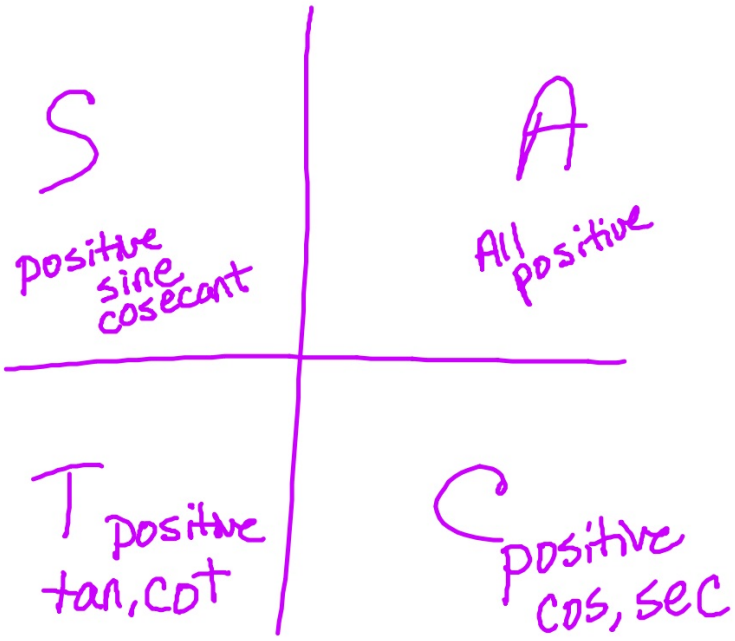


$\tan\theta = \frac{y}{x} = \frac{\sin\theta}{\cos\theta}$

$\cos\pi = -1$

$\tan\pi = 0$

$\tan 90^\circ$ = und.

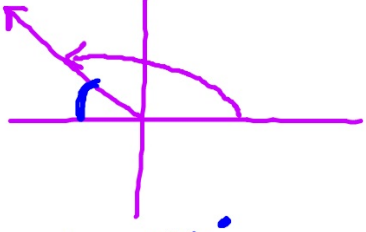

S
positive
sine
cosecant
A
All
positive
T
positive
tan, cot
C
positive
cos, sec

Reference angle: an acute angle formed by the terminal side of the angle and the 'closest' x-axis.

Find the refernce angle

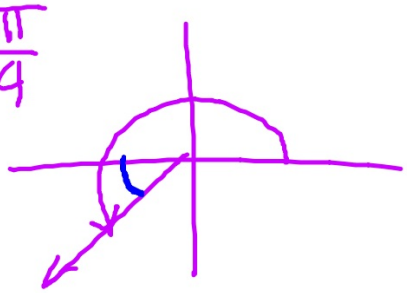
$\pi + \frac{\pi}{4}$

140°



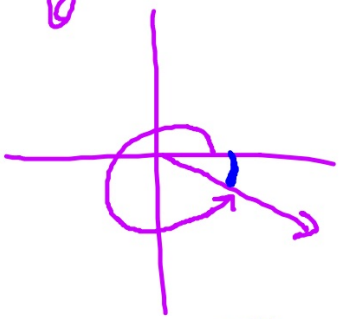
$\alpha = 40^\circ$

$\frac{5\pi}{4}$



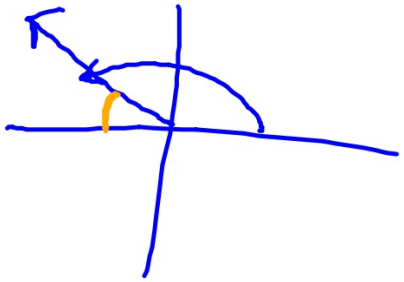
$\alpha = \frac{\pi}{4}$

$\frac{11\pi}{6}$



$\alpha = \frac{\pi}{6}$

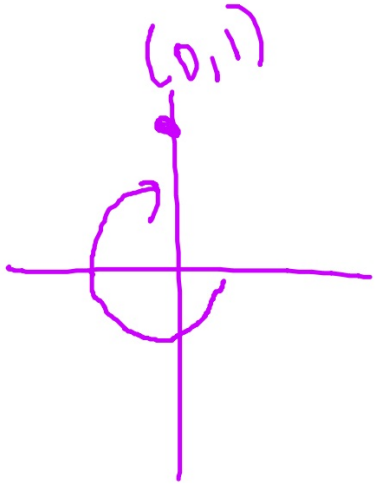
$\alpha = \frac{7\pi}{10}$



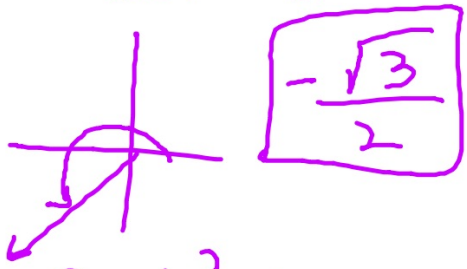
$\alpha = \frac{3\pi}{10}$

Evaluate.

1. $\sin\frac{\pi}{3} = \frac{\sqrt{3}}{2}$
2. $\cos 45^\circ = \frac{\sqrt{2}}{2}$
3. $\sin 270^\circ = -1$
4. $\cos\left(-\frac{3\pi}{2}\right) = 0$
5. $\sin\frac{\pi}{6} = \frac{1}{2}$



(6) $\cos\frac{7\pi}{6}$

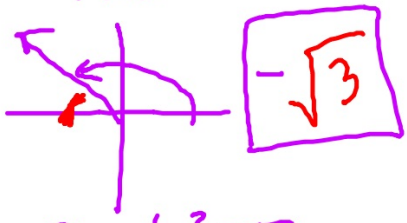


$-\frac{\sqrt{3}}{2}$

Quad ? III

$\alpha = \frac{\pi}{6}$

(7) $\tan 120^\circ$



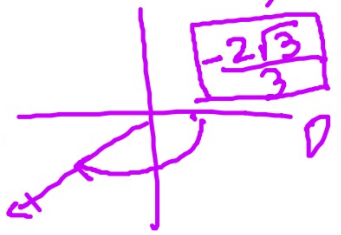
$-\sqrt{3}$

Quad ? II

$\alpha = 60^\circ$

$\tan 60^\circ = \frac{y}{x} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}}$

(8) $\csc\left(-\frac{2\pi}{3}\right)$



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

Quad III

$\alpha = \frac{\pi}{3}$

(9)

$\cos \frac{5\pi}{3}$

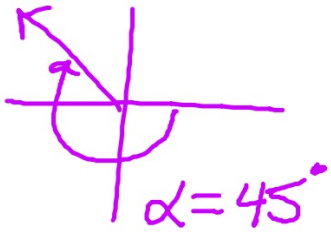
Quad? IV

$+\frac{1}{2}$

$\alpha = \frac{\pi}{3}$

(10)

$\cot(-225^\circ)$



$\alpha = 45^\circ$

-1

(11)

$\sec \frac{3\pi}{4}$

$-\sqrt{2}$

$\alpha = \frac{\pi}{4}$