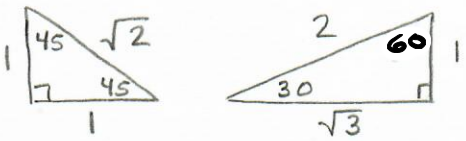


θ	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$
$\sin\theta$	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
$\cos\theta$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$

MATH 1080 TRIGONOMETRY

7.3 Worksheet – Unit Circle

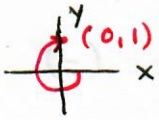
Name KEY

Date

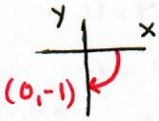
SOH - CAH - TOA

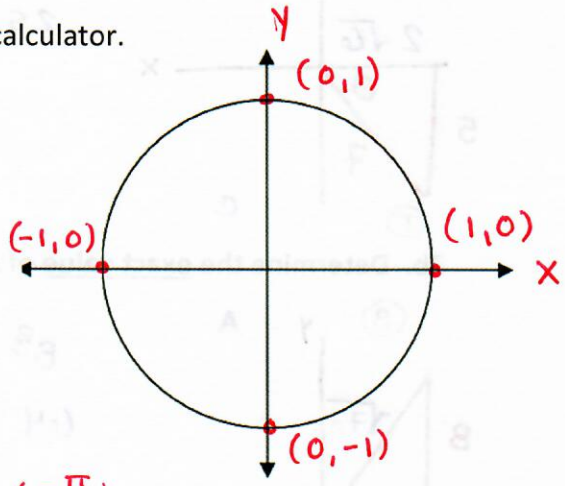
1. Use a unit circle to determine each **exact** value without a calculator.

a. $\sin(-270°)$ = 1



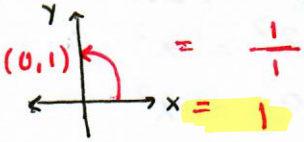
b. $\cos(-90°)$ = 0



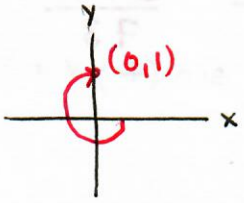


c. $\sec(3\pi) = \frac{1}{\cos 3\pi} = \frac{1}{-1} = -1$

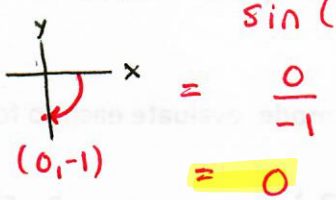
d. $\csc\left(\frac{\pi}{2}\right) = \frac{1}{\sin\frac{\pi}{2}} = \frac{1}{1} = 1$



e. $\tan\left(-\frac{3\pi}{2}\right) = \frac{\sin\left(-\frac{3\pi}{2}\right)}{\cos\left(-\frac{3\pi}{2}\right)} = \frac{1}{0}$ = undefined



f. $\cot\left(-\frac{\pi}{2}\right) = \frac{\cos\left(-\frac{\pi}{2}\right)}{\sin\left(-\frac{\pi}{2}\right)} = \frac{0}{-1} = 0$

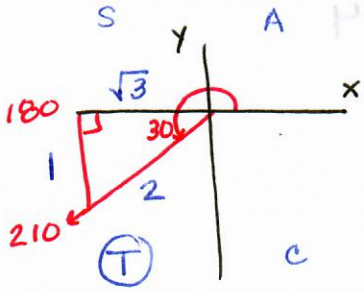


$x = \cos\theta$

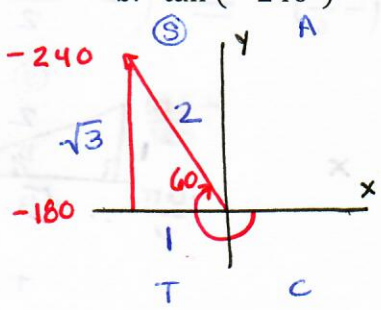
$y = \sin\theta$

2. Using a unit circle, draw the triangle in the appropriate quadrant, stating the reference angle and lengths of the sides. Then determine the **exact value** without a calculator.

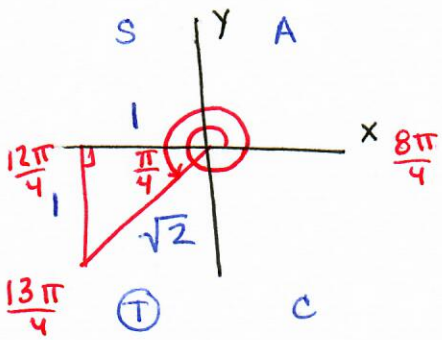
a. $\cos 210°$ $= -\frac{\sqrt{3}}{2}$



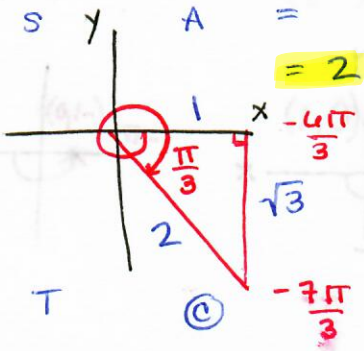
b. $\tan(-240°) = \frac{opp}{adj}$ (TOA) $= -\frac{\sqrt{3}}{1} = -\sqrt{3}$



c. $\sin\left(\frac{13\pi}{4}\right)$ $= -\frac{\sqrt{2}}{2}$

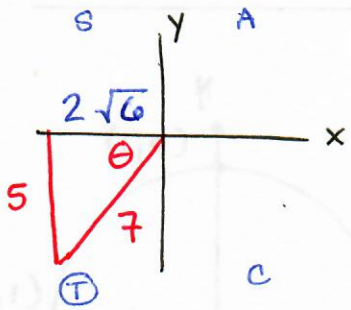


e. $\sec\left(-\frac{7\pi}{3}\right) = \frac{1}{\cos\left(-\frac{7\pi}{3}\right)} = \frac{1}{\frac{1}{2}} = 2$



SOH

3a. Determine the **exact value** of $\cos\theta$, *if* $\sin\theta = -\frac{5}{7}$ *in QIII.*



$5^2 + x^2 = 7^2$

$25 + x^2 = 49$

$x^2 = 24$

$x = \sqrt{4 \cdot 6}$

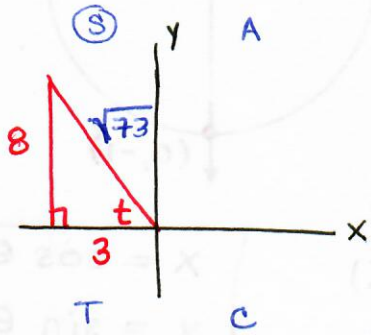
$x = 2\sqrt{6}$

$\cos\theta = \frac{adj}{hyp}$

$= \frac{-2\sqrt{6}}{7}$

QIII $\Rightarrow$ cos (−)

3b. Determine the **exact value** of $\sin(t)$, *if* $\tan(t) = -\frac{8}{3}$ *in QII.*



TOA

$8^2 + 3^2 = x^2$

$64 + 9 = x^2$

$73 = x^2$

$\sqrt{73} = x$

$\sin t = \frac{opp}{hyp}$

$= \frac{8}{\sqrt{73}}\left(\frac{\sqrt{73}}{\sqrt{73}}\right)$

$= \frac{8\sqrt{73}}{73}$

QII $\Rightarrow$ sin (+)

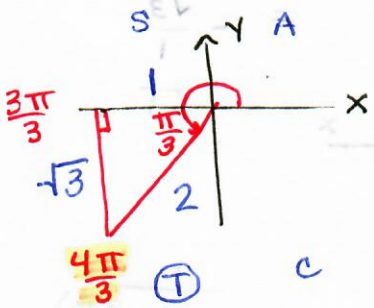
4. Using a calculator **in radian mode**, evaluate each to four decimal places.

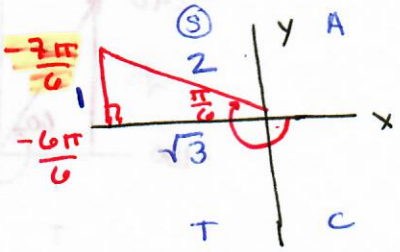
a. $\cos\left(-\frac{9\pi}{4}\right)$ ≈ 0.7071

b. $\sin\left(\frac{7\pi}{6}\right)$ $= -0.5000$

5. Using a unit circle, determine the exact value of each product. **NO CALCULATOR.**

a. $\sin\left(\frac{4\pi}{3}\right)\cos\left(-\frac{7\pi}{6}\right)$ $= \left(-\frac{\sqrt{3}}{2}\right)\left(-\frac{\sqrt{3}}{2}\right) = \frac{3}{4}$





b. $\sin\left(-\frac{3\pi}{2}\right)\cos(-\pi)$ $= (1)(-1) = -1$