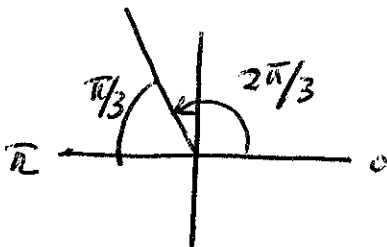


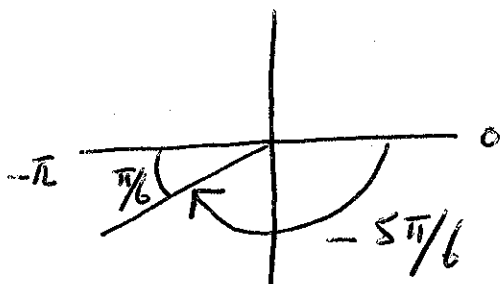
# 10350 Trigonometry Quiz

1. State the quadrant the following angles (in radians) are in and their reference angle.

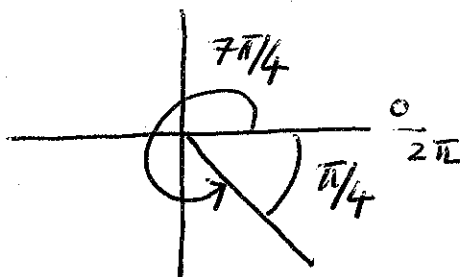
1a.  $\frac{2\pi}{3}$     Quadrant: 2<sup>nd</sup>    Reference Angle:  $\frac{\pi}{3}$



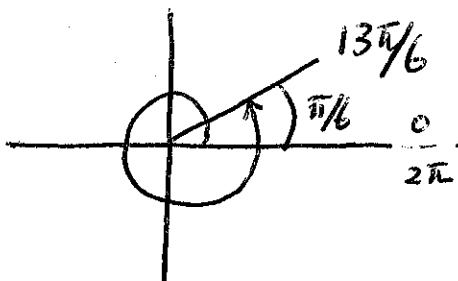
1b.  $-\frac{5\pi}{6}$     Quadrant: 3<sup>rd</sup>    Reference Angle:  $\frac{\pi}{6}$



1c.  $\frac{7\pi}{4}$     Quadrant: 4<sup>th</sup>    Reference Angle:  $\frac{\pi}{4}$



1d.  $\frac{13\pi}{6}$     Quadrant: 1<sup>st</sup>    Reference Angle:  $\frac{\pi}{6}$



2. Convert  $240^\circ$  to radians.

$$180^\circ = \pi \text{ rad} \Rightarrow 1^\circ = \frac{\pi}{180} \text{ rad}$$

$$240^\circ = 240 \times \frac{\pi}{180} = \frac{4\pi}{3} \text{ rad.}$$

3. Convert  $\frac{3}{5}\pi$  to degrees.

$$1 \text{ rad} = \frac{180^\circ}{\pi}$$

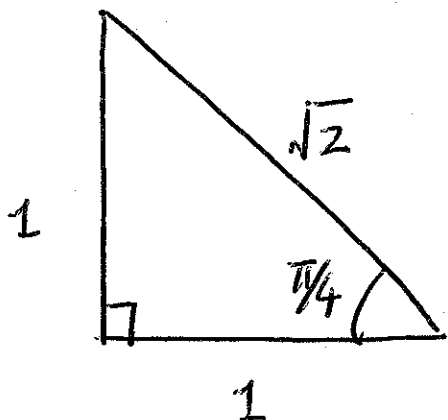
$$\begin{aligned} \frac{3}{5}\pi &= \frac{3\pi}{5} \times \frac{180^\circ}{\pi} \\ &= 3 \times 36 = 90 + 18 \\ &= 108^\circ \end{aligned}$$

$$\begin{aligned} \frac{180}{5} &= \frac{18 \times 10^2}{5} \\ &= 36 \end{aligned}$$

4. Explain using a suitable triangle why  $\sin\left(\frac{\pi}{4}\right) = \frac{1}{\sqrt{2}}$

$$\boxed{\frac{\pi}{4} = 45^\circ}$$

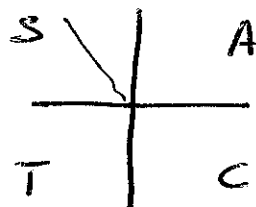
$\frac{\pi}{4}$  is contained in a right isosceles triangle with both legs = 1 unit.



$$\text{So } \sin \frac{\pi}{4} = \frac{1}{\sqrt{2}}$$

5. Find the exact value of the following trigonometric function values. You may find your answers to Question 1 helpful.

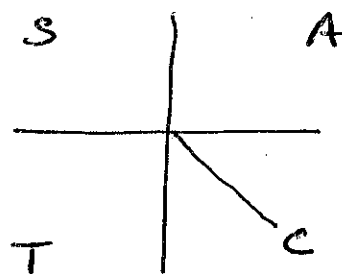
$$\begin{aligned} 5a. \sin\left(\frac{2\pi}{3}\right) &= \sin \frac{\pi}{3} \\ &= \frac{\sqrt{3}}{2} \end{aligned}$$



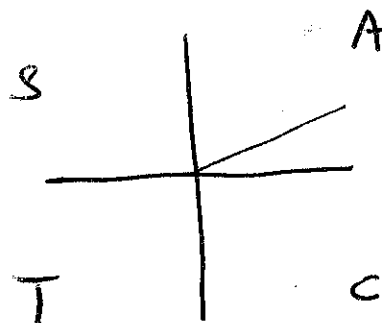
$$\begin{aligned} 5b. \cos\left(-\frac{5\pi}{6}\right) &= -\cos\left(\frac{\pi}{6}\right) \\ &= -\frac{\sqrt{3}}{2} \end{aligned}$$



$$\begin{aligned} 5c. \tan\left(\frac{7\pi}{4}\right) &= -\tan\left(\frac{\pi}{4}\right) \\ &= -1 \end{aligned}$$



$$\begin{aligned} 5d. \csc\left(\frac{13\pi}{6}\right) &= \csc\left(\frac{\pi}{6}\right) \\ &= \frac{1}{\sin\left(\frac{\pi}{6}\right)} = \frac{1}{(1/2)} = 2 \end{aligned}$$



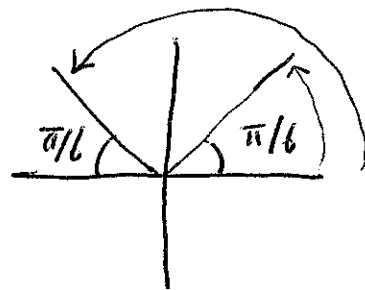
4. Find all possible values of  $x$  for the given range:

4a.  $\sin(x) = 0.5$       $0 < x < 2\pi$

$$x = \frac{\pi}{6}, \pi - \frac{\pi}{6}$$

$$= \frac{\pi}{6}, \frac{5\pi}{6}$$

$\sin x > 0$   
 $\Rightarrow x$  in 1<sup>st</sup> or 2<sup>nd</sup> quad



$$\sin x = \frac{1}{2} = \sin \frac{\pi}{6}$$

ref. angle =  $\frac{\pi}{6}$

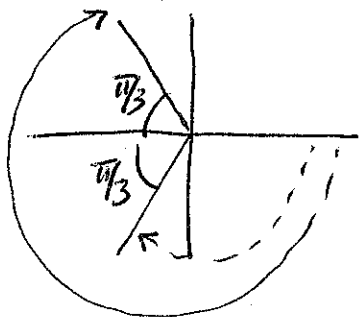
4b.  $\cos(x) = -0.5$       $-2\pi < x < 2\pi$

$\cos x = -0.5 < 0$   
 $\Rightarrow x$  in 2<sup>nd</sup> or 3<sup>rd</sup> quad.

$$\cos \frac{\pi}{3} = 0.5$$

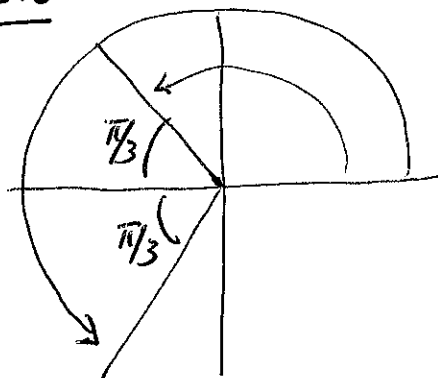
ref angle =  $\frac{\pi}{3}$

$-2\pi < x < 0$



$$x = -\pi + \frac{\pi}{3}, -\pi - \frac{\pi}{3}$$

$0 < x < 2\pi$



$$x = \pi - \frac{\pi}{3}, \pi + \frac{\pi}{3}$$

So  $x = -\frac{2\pi}{3}, -\frac{4\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}$