Unit 8 Notes Obj. 6 More Radian Measurements

$$180^\circ = 1\pi \text{ radian}$$
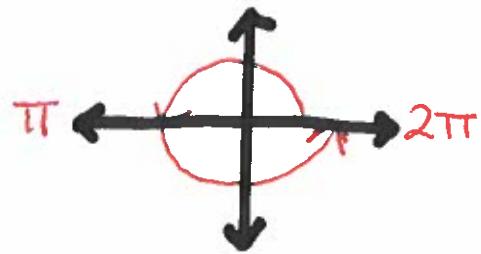
What does 1° = ?

$$\frac{180^\circ}{180^\circ} = \frac{\pi}{180^\circ}$$

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

What does 1 radian = ?

$$\frac{180^\circ}{\pi} = \frac{\pi}{\pi}$$

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

To convert from Degrees to Radians:

multiply by $\frac{\pi}{180}$

To convert from Radians to Degrees:

multiply by $\frac{180}{\pi}$

Example A: What is the equivalent of $\frac{7\pi}{10}$?

radians → degrees

$$\frac{7\pi}{10} \cdot \frac{180}{\pi} = \frac{1260}{10} = 126^\circ$$

Example B: What is the equivalent of 250°?

degrees → radians

$$250 \cdot \frac{\pi}{180} = \frac{250\pi}{180} = \frac{25\pi}{18}$$

SohCahToa

$$\begin{array}{c|c} S & A \\ \hline T & C \end{array}$$

	Degrees	Radians
	360° =	2π

$\text{Sin} = \dfrac{y}{r}$

180° = π

90° = $\dfrac{\pi}{2}$

$\text{Cos} = \dfrac{x}{r}$

60° = $\dfrac{\pi}{3}$

45° = $\dfrac{\pi}{4}$

$\text{Tan} = \dfrac{y}{x}$

30° = $\dfrac{\pi}{6}$

30° $\frac{\pi}{6}$ — ② — ① — ⟂ — ③ circled $\sqrt{3}$

45' $\frac{\pi}{4}$ — $\sqrt{2}$ — ① — ① — ①

60° $\frac{\pi}{3}$ — ② — $\sqrt{3}$ — ① — ⟂

$\theta = \dfrac{11\pi}{3}$

$\text{ref} = \dfrac{\pi}{3}$ $Q = 4$

$\text{Sin} = -\dfrac{\sqrt{3}}{2}$

$\text{Cos} = \dfrac{1}{2}$

$\text{Tan} = -\dfrac{\sqrt{3}}{1}$

$\theta = -\dfrac{13\pi}{4}$

$\text{ref} = \dfrac{\pi}{4}$ $Q = 2$

$\text{Sin} = \dfrac{1}{\sqrt{2}}$ or $\dfrac{\sqrt{2}}{2}$

$\text{Cos} = -\dfrac{1}{\sqrt{2}}$ or $-\dfrac{\sqrt{2}}{2}$

$\tan = -1$

$\theta = \dfrac{10\pi}{4}$
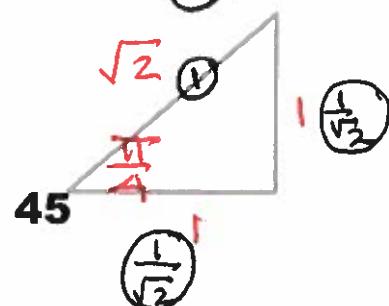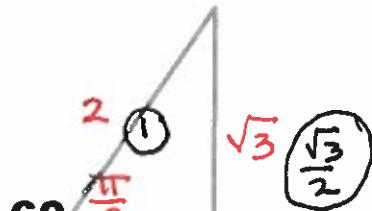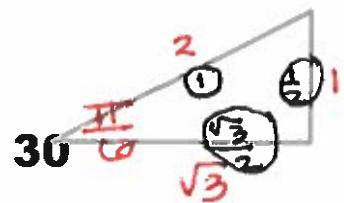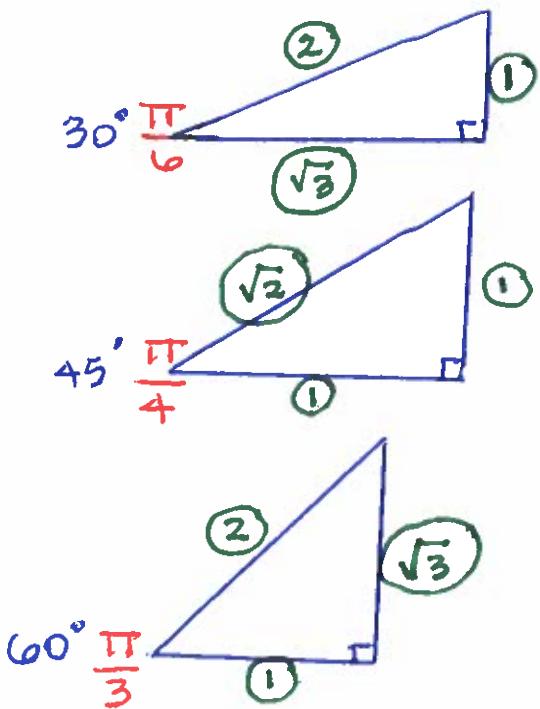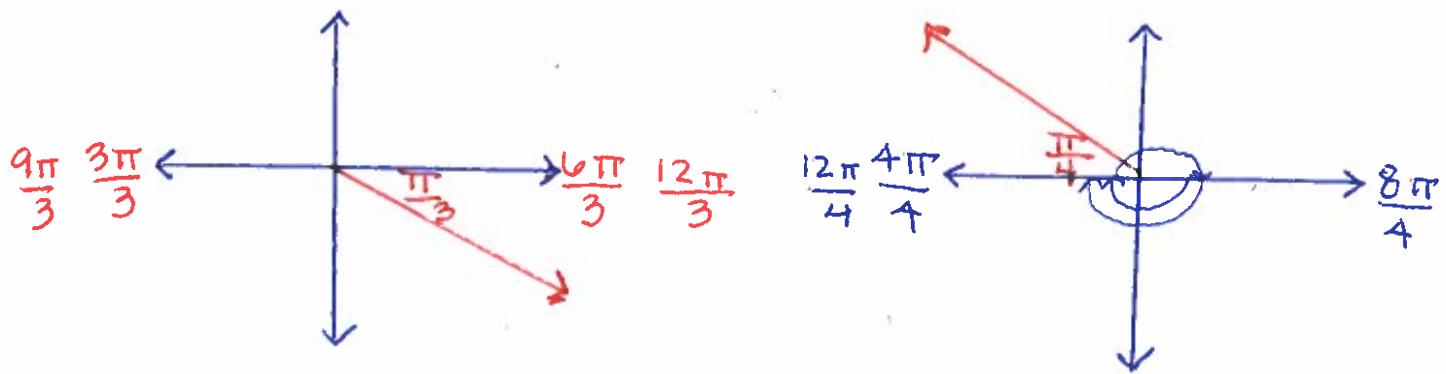
$\text{ref} = $ Quadrantal between Q's 2 and 1

$\text{Sin} = \dfrac{y}{r} = \dfrac{1}{1} = 1$

$\text{Cos} = \dfrac{x}{r} = \dfrac{0}{1} = 0$

$\tan = \dfrac{y}{x} = \dfrac{1}{0} = \text{undef}$