

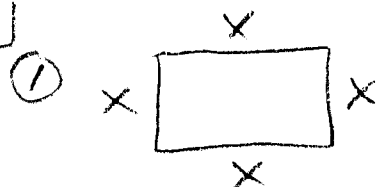
BE-Geometry 11

Wednesday 11-30-11

ACT
PRACTICE

- ① The perimeter of a square is 24 ft. What is the area of the square (in square ft).
- ② WHAT IS 7% of 4.58×10^6
- ③ What are the factors of $x^2 - 6x + 8$?

ANS



$$4x = 24 \therefore x = 6$$

$$\therefore A = 6^2 = \boxed{36 \text{ ft}^2}$$

$$\textcircled{2} 7\% = .07 = (7 \times 10^{-2})(4.58 \times 10^6)$$

$$32.06 \times 10^4 = 320,600$$

③ $\begin{array}{l} \text{Sum} \Rightarrow -6 \\ \text{prod} \Rightarrow 8 \end{array}$

$\begin{array}{c} -2 \quad -4 \end{array}$

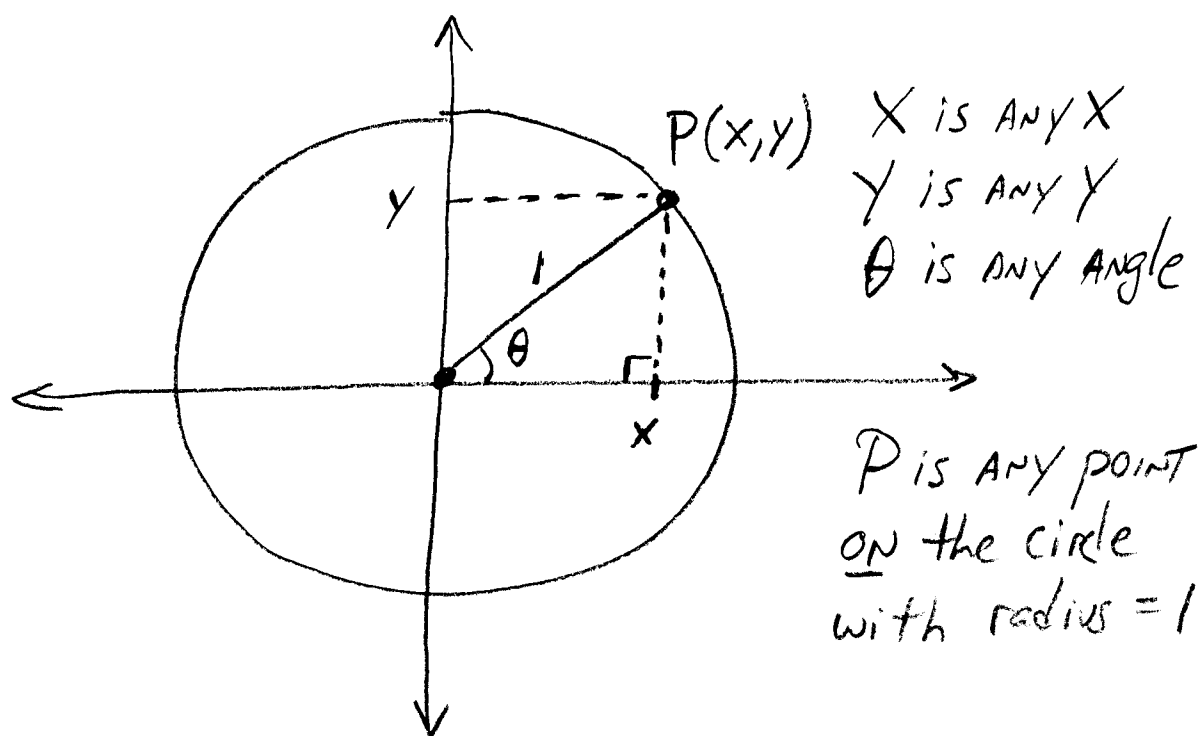
$$\boxed{(x-2)(x-4)}$$

A very powerful tool...

The Unit Circle

$$\text{UNITY} = 1$$

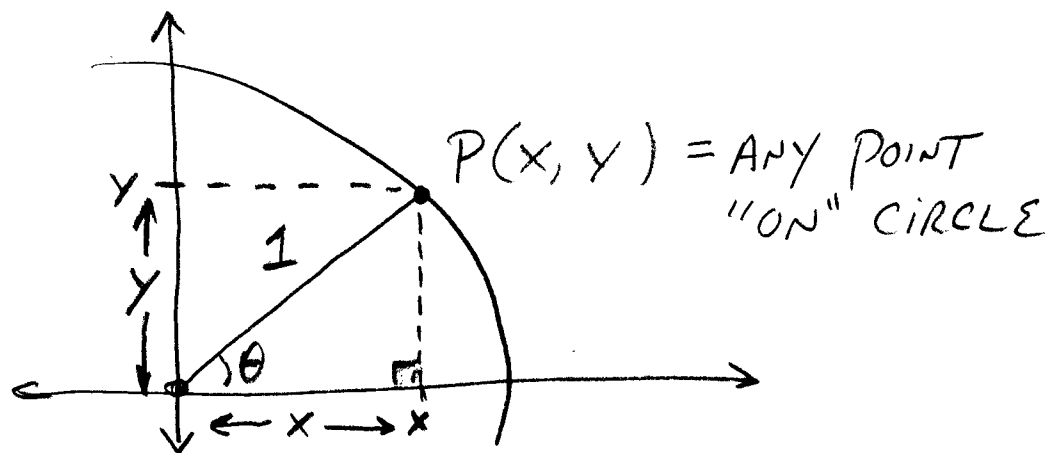
A "unit circle" is a circle
WITH A radius of 1. WATCH
WHAT happens with the trig.
functions & be Amazed!



What is the $\sin \theta$?

NOTE: ALL RIGHT Δ 'S WITH $\angle \theta$ ARE SIMILAR!

Looking just AT Quadrant I for EXAMPLE:



$$\sin \theta = \frac{y}{1} = y$$

$$\cos \theta = \frac{x}{1} = x$$

$$\tan \theta = \frac{y}{x} = \frac{\text{rise}}{\text{run}}$$

For ANY point "ON" the UNIT circle,

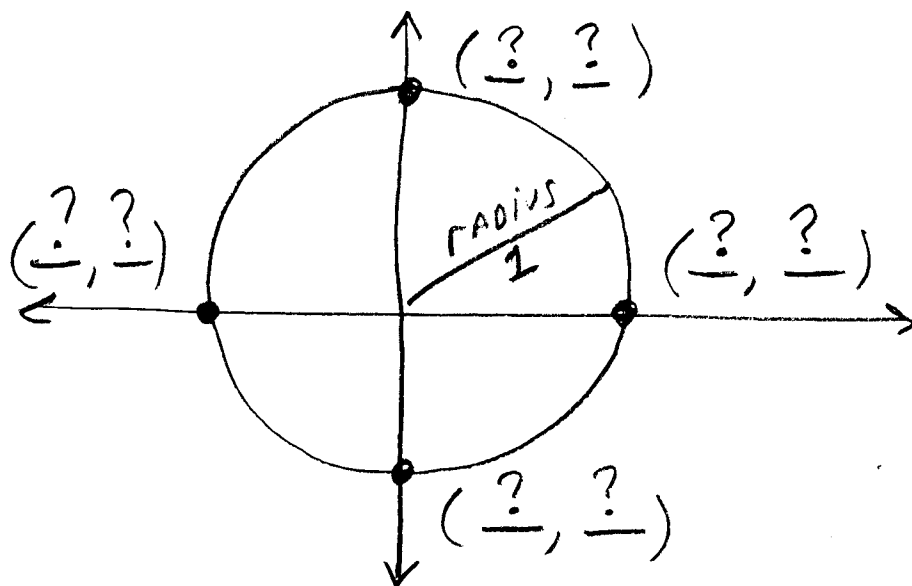
$$\left. \begin{array}{c} P(x, y) \\ \uparrow \uparrow \\ \cos \theta \quad \sin \theta \end{array} \right\} \text{ AND } \tan \theta = \frac{y}{x}$$

Quadrangles: the angles formed by the
X and Y axis:

$$0^\circ, 90^\circ, 270^\circ, 360^\circ$$

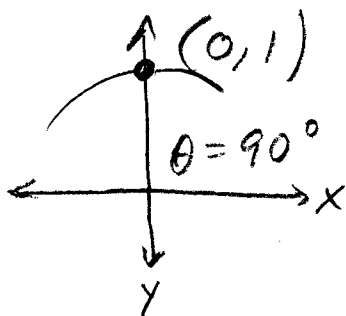
Here is the first useful way
to use the UNIT circle, to
find the $\sin$, $\cos$, $\tan$ of $0^\circ, 90^\circ, 270^\circ, 360^\circ$.

Label the following points on the
UNIT circle: $[(x, y) \text{ coordinates.}]$



$\theta = 0$
 $(1, 0)$
 $\uparrow \quad \uparrow$
 $\cos, \sin$

$\sin 0^\circ = y = 0$
 $\cos 0^\circ = x = 1$
 $\tan 0^\circ = \frac{y}{x} = \frac{0}{1} = 0$

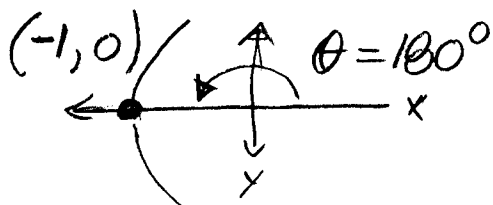


$$\sin 90^\circ = y = 1$$

$$\cos 90^\circ = x = 0$$

$$\tan 90^\circ = \frac{y}{x} = \frac{1}{0} = \text{undefined}$$

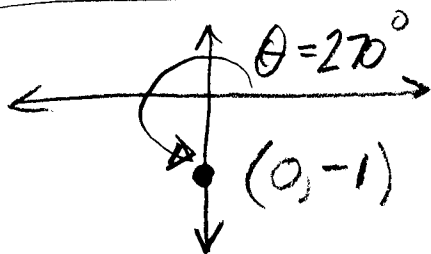
↑
SLOPE OF VERTICAL LINE IS UNDEFINED



$$\sin 180^\circ = y = 0$$

$$\cos 180^\circ = x = -1$$

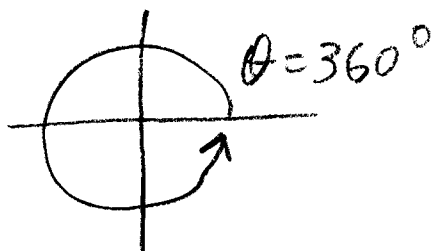
$$\tan 180^\circ = \frac{y}{x} = \frac{0}{-1} = 0$$



$$\sin 270^\circ = y = -1$$

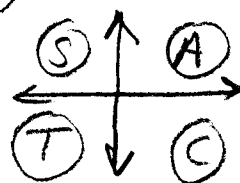
$$\cos 270^\circ = x = 0$$

$$\tan 270^\circ = \frac{y}{x} = \frac{-1}{0} = \text{undefined}$$

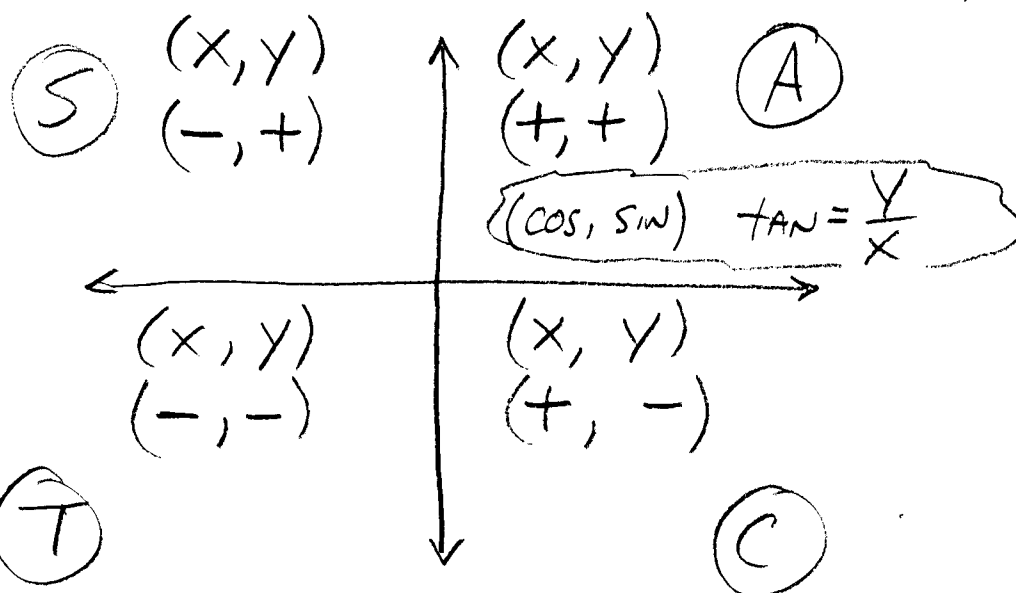


the trig. functions
for $\theta = 360^\circ$ are the
same as $\theta = 0^\circ$

Does the unit circle lead to the signs of the trig. functions in each quadrant?



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



Homework: On a full-size sheet of graph paper, use your trig. table and your new knowledge of the value of the trig. functions at the quadrangles to graph the function $y = f(x) = \sin(x)$ for $x^\circ = \{0, 15, 30, 45, 60, 75, 90, 105, 120, \dots, 135, 150, 165, 180\}$. Can you go to 360° ?

SHOW your
T-TABLE

x°	$\sin(x)$