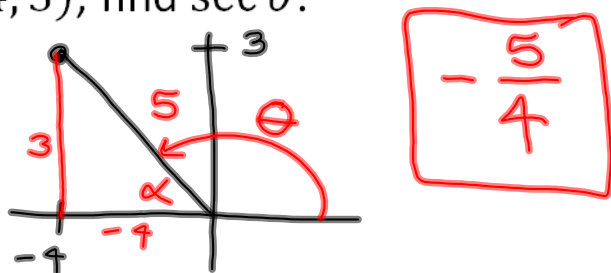


Review:

For the angle θ whose terminal side passes through the point $(-4, 3)$, find $\sec \theta$.



A reference angle is the positive acute angle between terminal side and X-axis

In which quadrant(s) is the cosine function positive?

I & IV

Homework questions?

$$\frac{54}{71}. \quad r = \frac{15 \text{ cm}}{2}, \quad \omega = \frac{7 \text{ rad}}{\text{sec}}; \quad v = ? \text{ cm/min}$$

$$v = r\omega = \frac{15 \text{ cm}}{2} \cdot \frac{7 \text{ rad}}{\cancel{\text{s}}} \cdot \frac{60 \cancel{\text{s}}}{1 \text{ min}}$$

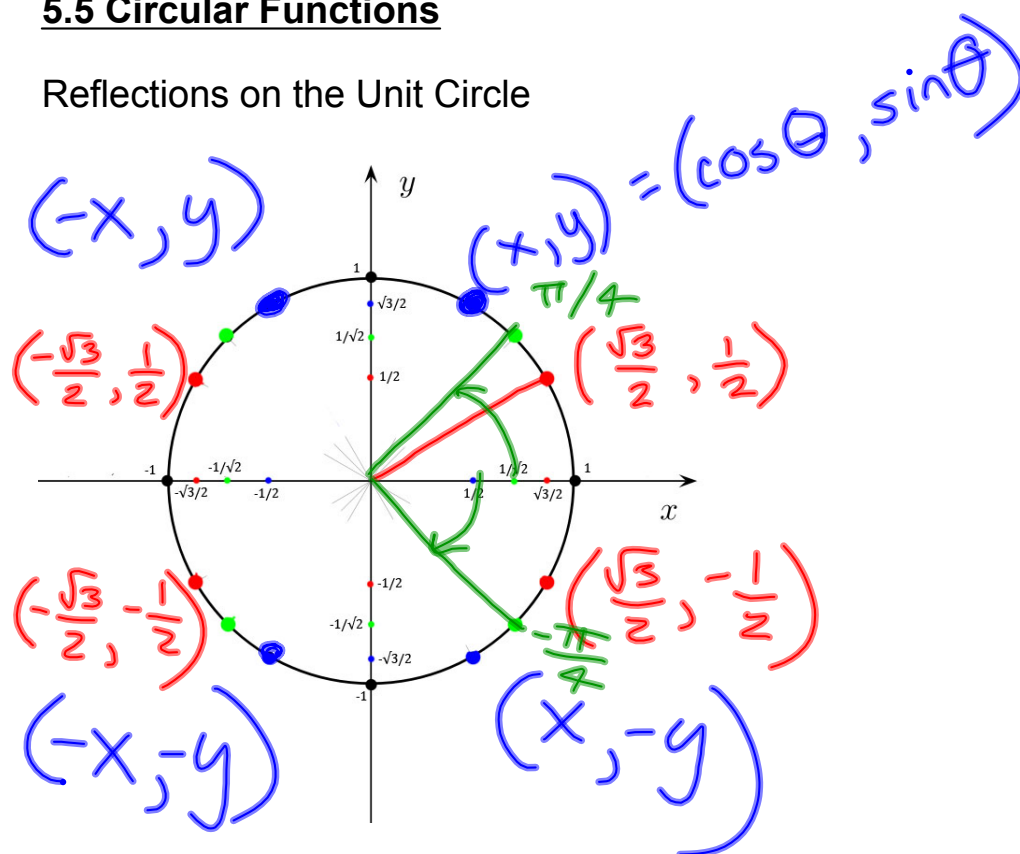
$$73. \quad r = \frac{13.37 \text{ in}}{2}; \quad v = \frac{18.33 \text{ ft}}{\text{s}}; \quad \omega = ? \frac{\text{rev}}{\text{h}}$$

$$\frac{v}{r} = \omega \quad \omega = \frac{v}{r} \cdot \frac{1}{r}$$

$$\omega = \frac{18.33 \text{ ft}}{\text{s}} \cdot \frac{2}{13.37 \text{ in}} \cdot \frac{1 \text{ rev}}{2\pi}$$

5.5 Circular Functions

Reflections on the Unit Circle



Even/Odd Functions

A function f is **even** if $f(-x) = f(x)$

even fn's are symmetric w.r.t. the y -axis

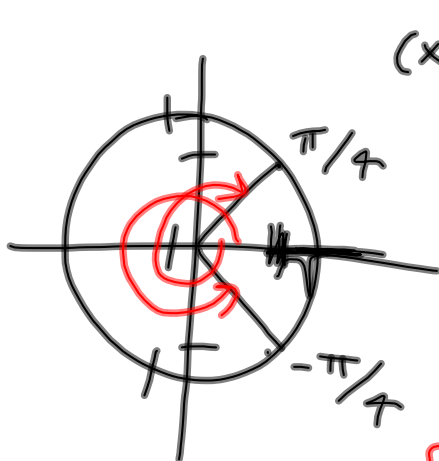
A function f is **odd** if $f(-x) = -f(x)$

odd fn's are symmetric w.r.t. the origin

Odd-Even Identities

$$\cos(-x) = \cos x, \quad \sin(-x) = -\sin x, \quad \tan(-x) = -\tan x$$

$$\sec(-x) = \sec x, \quad \csc(-x) = -\csc x, \quad \cot(-x) = -\cot x$$



$$(x, y) = (\cos \theta, \sin \theta)$$

$$\text{even: } f(-x) = f(x)$$

$$\text{odd: } f(-x) = -f(x)$$

$\cos x$ is even $[\cos(-x) = \cos x]$

$\sin x$ is odd $[\sin(-x) = -\sin x]$

$$\tan(-x) = \frac{\sin(-x)}{\cos(-x)} = \frac{-\sin x}{\cos x} = -\tan x$$

Domain/Range

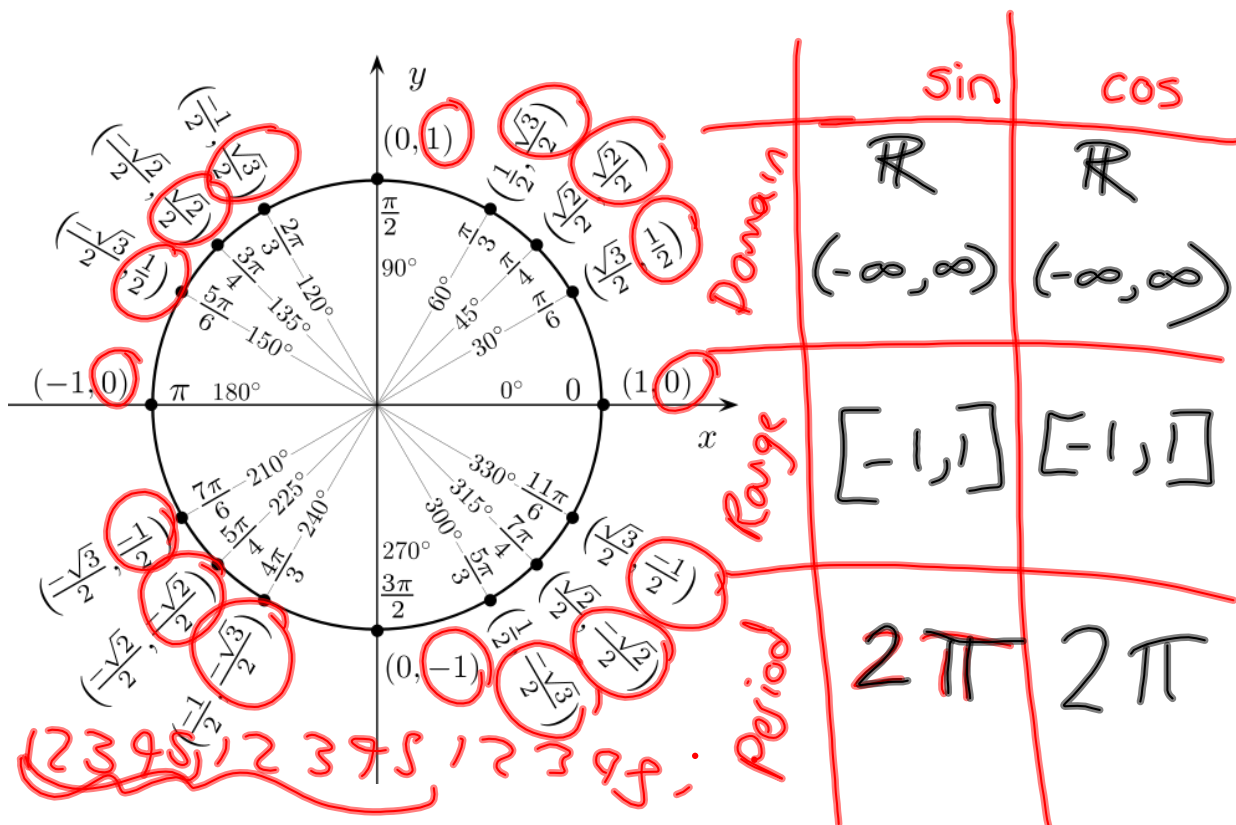
The domain of a function is the set of all input values for which the function is defined (all the x-values that "make sense" when plugged into the function)

The range of a function is the output of the domain (all the y-values that the function takes on)

Periodicity

The period of a function is the smallest interval over which the function repeats itself

Determining domain, range and period for the Sine & Cosine functions



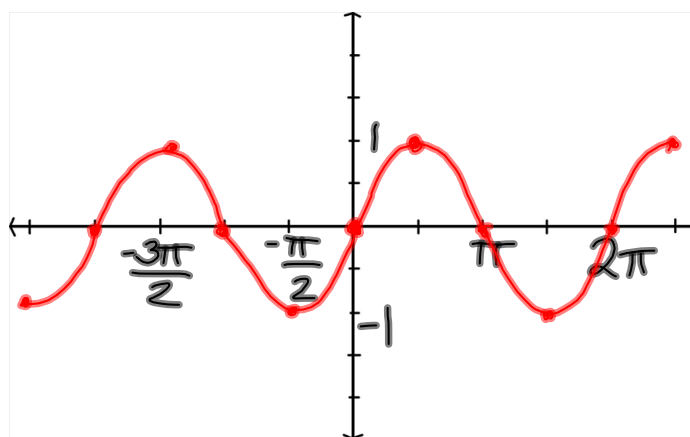
Graphs of the sine and cosine functions

$y = \sin x$

domain:
 $(-\infty, \infty)$

range:
 $[-1, 1]$

period:
 2π
odd



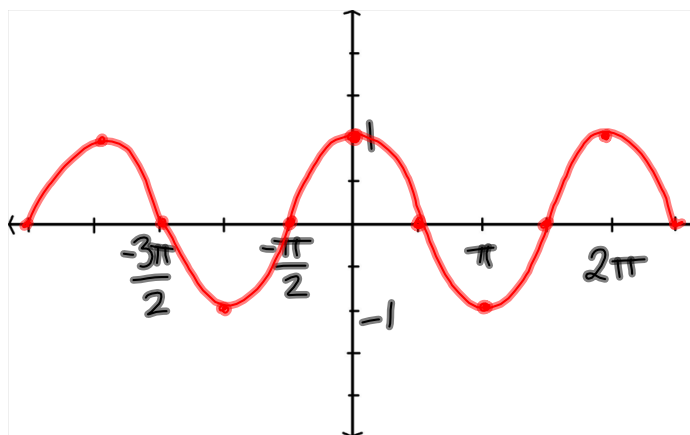
$y = \cos x$

domain:
 $(-\infty, \infty)$

range:
 $[-1, 1]$

period:
 2π

even



Domain/Range/Period/Graphs of the other 4 Trig functions?

Function	Domain	Range	Period
$y = \sin x$	$(-\infty, \infty)$	$[-1, 1]$	2π
$y = \cos x$	$(-\infty, \infty)$	$[-1, 1]$	2π
$y = \csc x$	$\{x x \text{ is not an integer multiple of } \pi\}$	$(-\infty, -1] \cup [1, \infty)$	2π
$y = \sec x$	$\{x x \text{ is not an odd multiple of } \frac{\pi}{2}\}$	$(-\infty, -1] \cup [1, \infty)$	2π
$y = \tan x$	$\{x x \text{ is not an odd multiple of } \frac{\pi}{2}\}$	$(-\infty, \infty)$	π
$y = \cot x$	π	$(-\infty, \infty)$	π

Why?

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

$$\csc x = \frac{1}{\sin x}$$

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

$$\cot x = \frac{\cos x}{\sin x}$$

Homework:

5.5 #1-6; 43-44; 49-54

and

Test #1 Practice Problems (handout)

Tomorrow (Tuesday) - Review

Wednesday - **Test #1**

Friday - Graphing