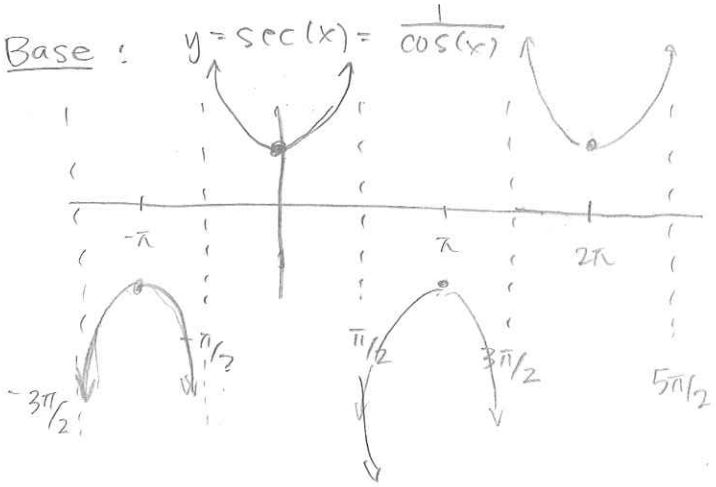
4/14/2011 Th
Section 10

§5.4

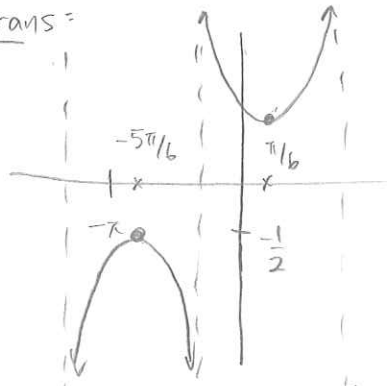
Last time: v. shrink by ½ ; shift R π/6

3.) $y = \frac{1}{2}\sec(x - \pi/6)$

Base: $y = \sec(x) = \frac{1}{\cos(x)}$



Trans:



$-\frac{3\pi}{2} + \frac{\pi}{6}$ $\quad -\frac{\pi}{2} + \frac{\pi}{6}$ $\quad \pi/2 + \pi/6$

$-\frac{4}{3}\pi$ $\quad = -\frac{\pi}{3}$ $\quad \frac{2\pi}{3}$

For exam 4: (5.4 material)

- Basic graphs of all 6 trig function: period, amp (if exist), local max/min, avg value, VA (if any)

§5.5 Modelling Harmonic Motions. functions

Simple harmonic motion (Sinusoidal)

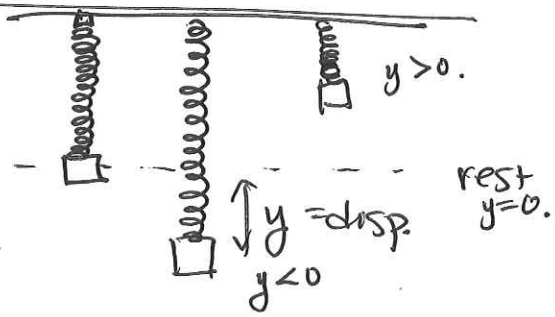
$y = a\sin(\omega t)$ or $y = a\cos(\omega t)$

amplitude: a

period: $2\pi/\omega$

frequency: $\omega/2\pi$ ← Number of cycles per unit of time

Vibrating Spring example:



$$y = 5\sin(3\pi t)$$

t in sec, y inches.

(a) Find period, amplitude, frequency.

period: $2\pi/3\pi = 2/3$ amp: 5 frequency: $3/2$.

(b) When is the ~~spring~~ the first time at a displacement of 2.5?

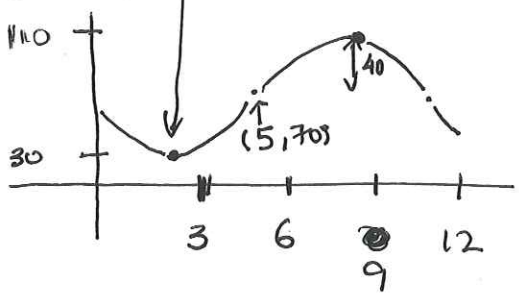
$2.5 = 5\sin(3\pi t)$

$\frac{1}{2} = \sin(3\pi t)$ ← calculator: $\sin^{-1}(\ )$

Using Special triangle $30°-60°-90°$ $\pi/3 - \pi/6 - \pi/2$ → $\pi/6 = 3\pi t$

$\frac{1}{18}$ seconds $= t$

Solution: (2, 110°) (8, 110°)



period should be 12 to make sense!

$y = 40\cos(\pi/6\,(t-8)) + 70$

#30, 35, 36. in groups of 2-4.

ex credit.

Names

Date 4/14/2011

Section 10

text p 452-453 (5.5)

(36 ex credit)