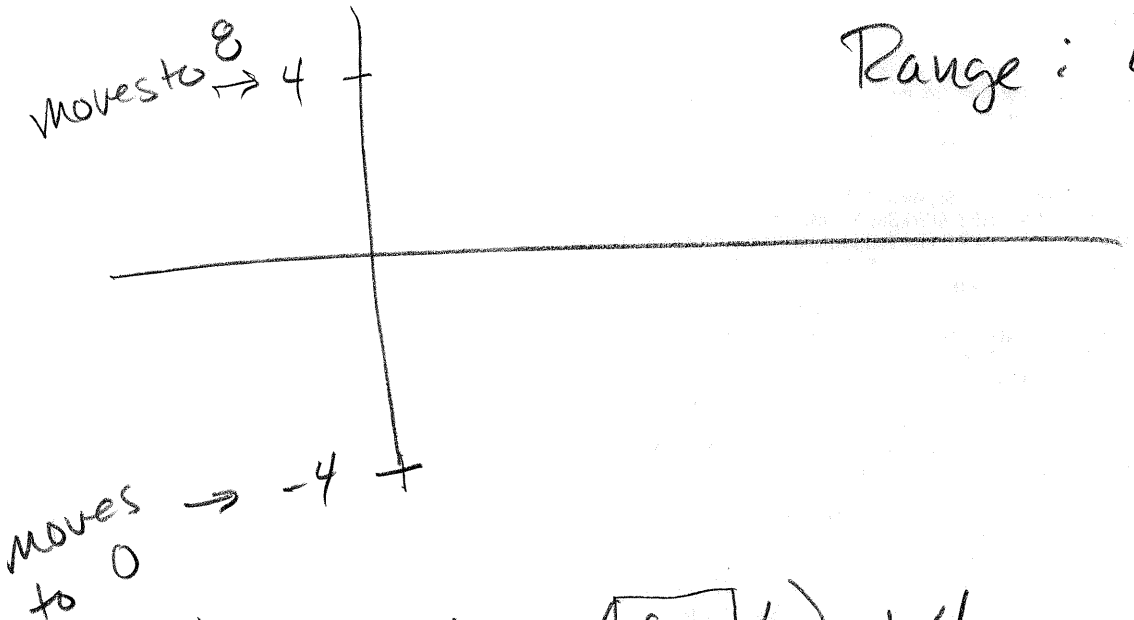
9/24/2012 - Sec 2.3 Math 1060

2.2 # 48 Amp = 4 Vertical Shift = 4



Range: [0, 8]

b. $v = -4\cos(6\pi t) + 4$

$$\text{frequency} = \frac{1}{\text{period}}$$

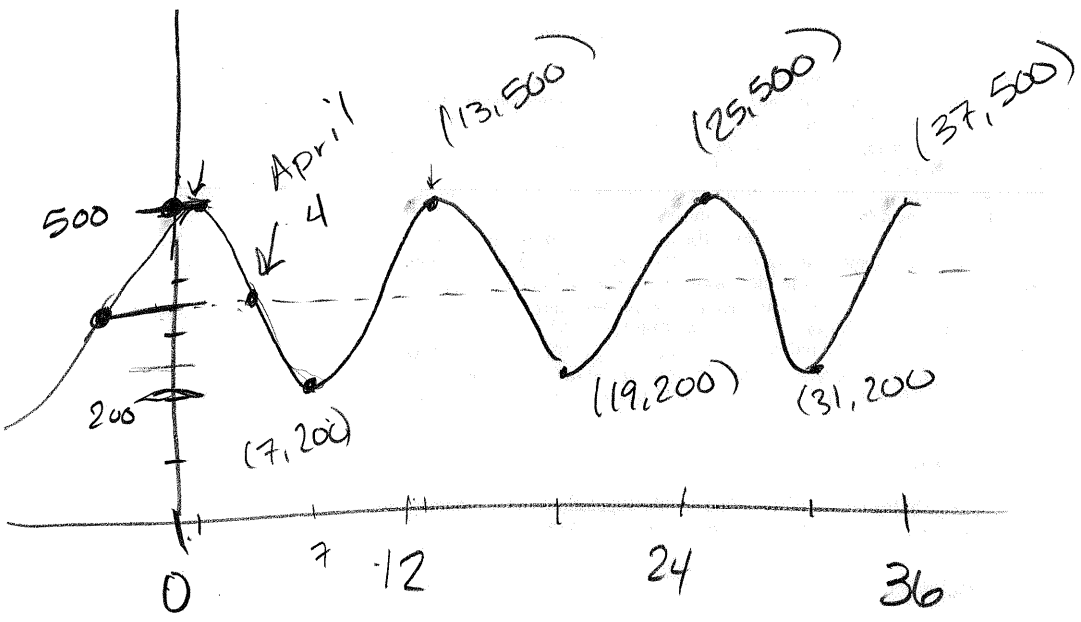
$$\text{period} = \frac{2\pi}{B}$$

$$= \frac{2\pi}{6\pi} = \frac{1}{3}$$

$$\text{frequency} = \frac{1}{1/3} \cdot \frac{3}{1} = 3 \frac{\text{beats}}{\text{sec}} \cdot \frac{60 \text{ sec}}{1 \text{ min}}$$

$$= 180 \text{ beats/min}$$

#50



Vertical Shift: 350

Amp = 150 = A

Period = 12 = $\frac{2\pi}{B}$ $\Rightarrow$ $\frac{12B}{12} = \frac{2\pi}{12}$

$B = \frac{\pi}{6}$

phase shift = Right 4

$y = A \sin[B(x-C)] + D$

$y = -150 \sin\left[\frac{\pi}{6}(x-4)\right] + 350$

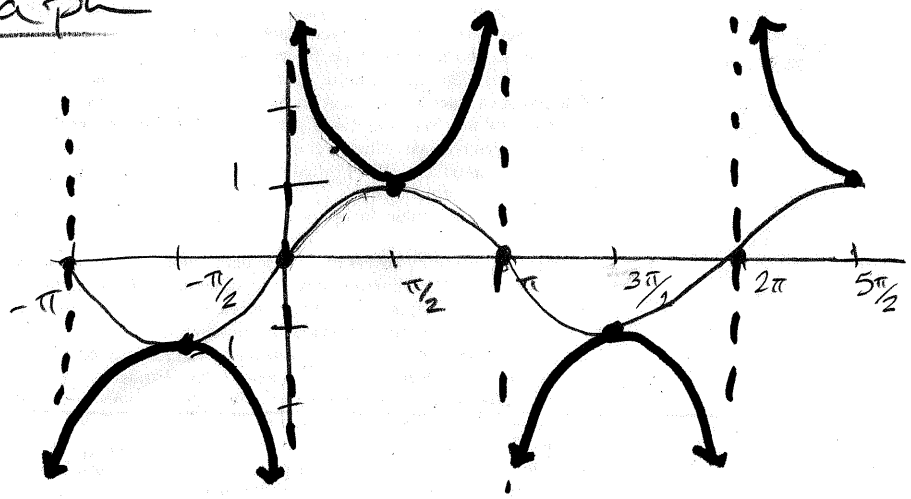
Nov $\Rightarrow x = 11$

shows.edu/janalees/1060

Sec 2.3 Graphs Secants and Cosecants

$$\sec\theta = \frac{1}{\cos\theta} \qquad \csc\theta = \frac{1}{\sin\theta}$$

Cosecant Graph



1. Graph $y = \sin x$

$$\csc\theta = \frac{1}{\sin\theta} = \frac{1}{0}$$

2. cosecant curve asymptote when $\sin x = 0$

$x = k\pi$, where k is any integer

3. when $\sin x = 1$, $\sin x = -1$ — when $\sin x = 1$ or -1, $\csc x = 1$ or -1

4. Examine $\sin x \to 0$

Facts about Cosecant

Period $= 2\pi$ (same as $y = \sin x$)

Asymptotes: $y = k\pi$

Range: $(-\infty, -1] \cup [1, \infty)$

General Cosecant

$$y = A \csc[B(x-C)] + D$$

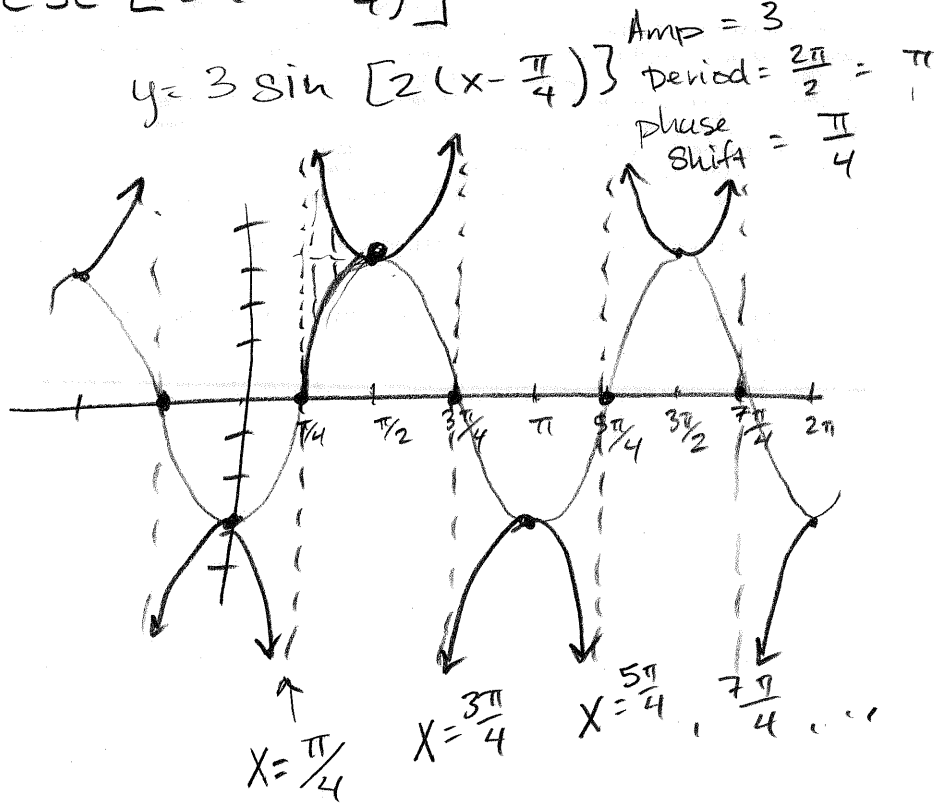
- A: Stretch
- B: Changes period
- C: phase shift
- D: vertical

Graph: $y = 3 \csc\left[2\left(x - \frac{\pi}{4}\right)\right]$

1st Graph the sine curve as a reference

2nd Determine Asymptotes

3rd Graph Cosecant Curve



Period = π

Asymptotes: $x = \frac{\pi}{4} + \frac{\pi}{2}k$

- $\frac{\pi}{4}$: Phase Shift
- $\frac{\pi}{2}$: half the period
- k: $*k$

Secant

Reference curve as cosine

$$x = \frac{\pi}{2} + \pi k$$