Day 70

Sine + Cosine Review

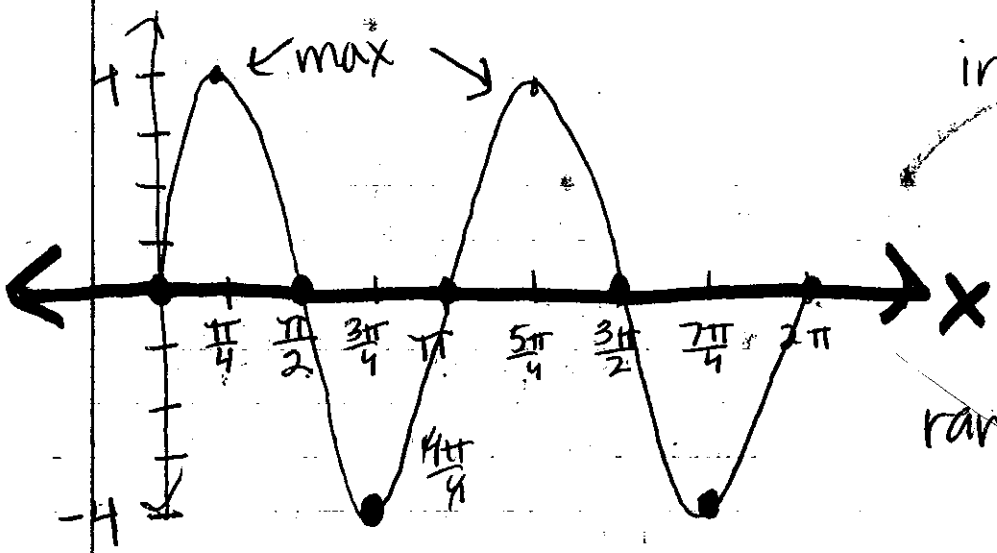
$$y = \overset{a}{4}\sin\overset{b}{2}\theta$$

How many cycles occur from 0 to 2π? 2

Period: $P = \frac{2\pi}{b} = \frac{2\pi}{2} = \pi$

Amplitude: $|4| = 4$

Graph from 0 to 2π.



increments: $\frac{P}{4}$

$\frac{\pi}{4}$ = XSCL on calculator

range: $[-4, 4]$

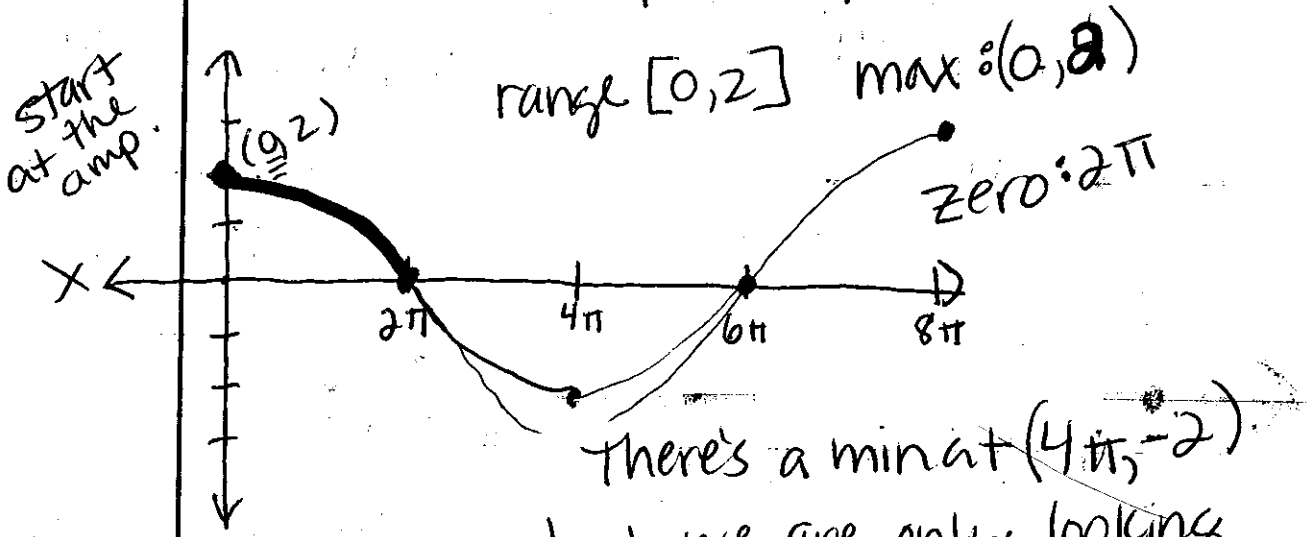
<u>zeros</u>: $0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}, 2\pi$

max: $\frac{\pi}{4}, \frac{5\pi}{4}$ <u>min</u>: $\frac{3\pi}{4}, \frac{7\pi}{4}$

$y = 2\cos\frac{1}{4}\theta$ (a = 2, b = $\frac{1}{4}$) amplitude = 2

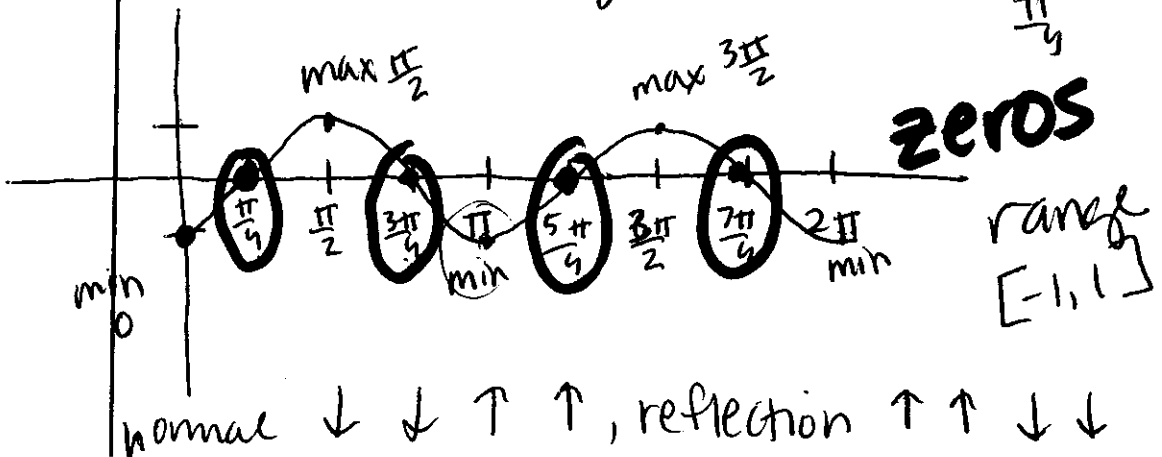
Period: $\frac{2\pi}{b} = \frac{2\pi}{1/4} = 2\pi \cdot \frac{4}{1} = 8\pi$

increments = $\frac{P}{4} = \frac{8\pi}{4} = 2\pi$



(ex) $y = -\cos 2\theta$ reflection

amp = 1 $P = \frac{2\pi}{2} = \pi$ increments: $\frac{\pi}{4}$



normal ↓ ↓ ↑ ↑, reflection ↑ ↑ ↓ ↓

Solve the equation from 0 to 2π using the graphing calculator. Round to the nearest hundredth.

(1) $3\cos 2t = -2$

$Y_1 = 3\cos(2X)$

$Y_2 = -2$

x min ↓ 0 to x-max ↓ 2π

[zoom] trig (adjust window to interval)

[2nd] [trace] 5: intersect to find Move cursor to the pt. (enter 3 times)

as many points of intersection in the interval given.

$X = 1.15, 1.99, 4.29, 5.13$

(2) $8\cos\frac{\pi}{3}t = 5$

Solve. From 0 to 2π.

$Y_1 = 8\cos((\pi/3)X)$

$Y_2 = 5$ ← y max 8

.86, 5.14

$P = \frac{2\pi}{\pi/3} = 2\pi \cdot \frac{3}{\pi}$

$P = 6$

Day 71

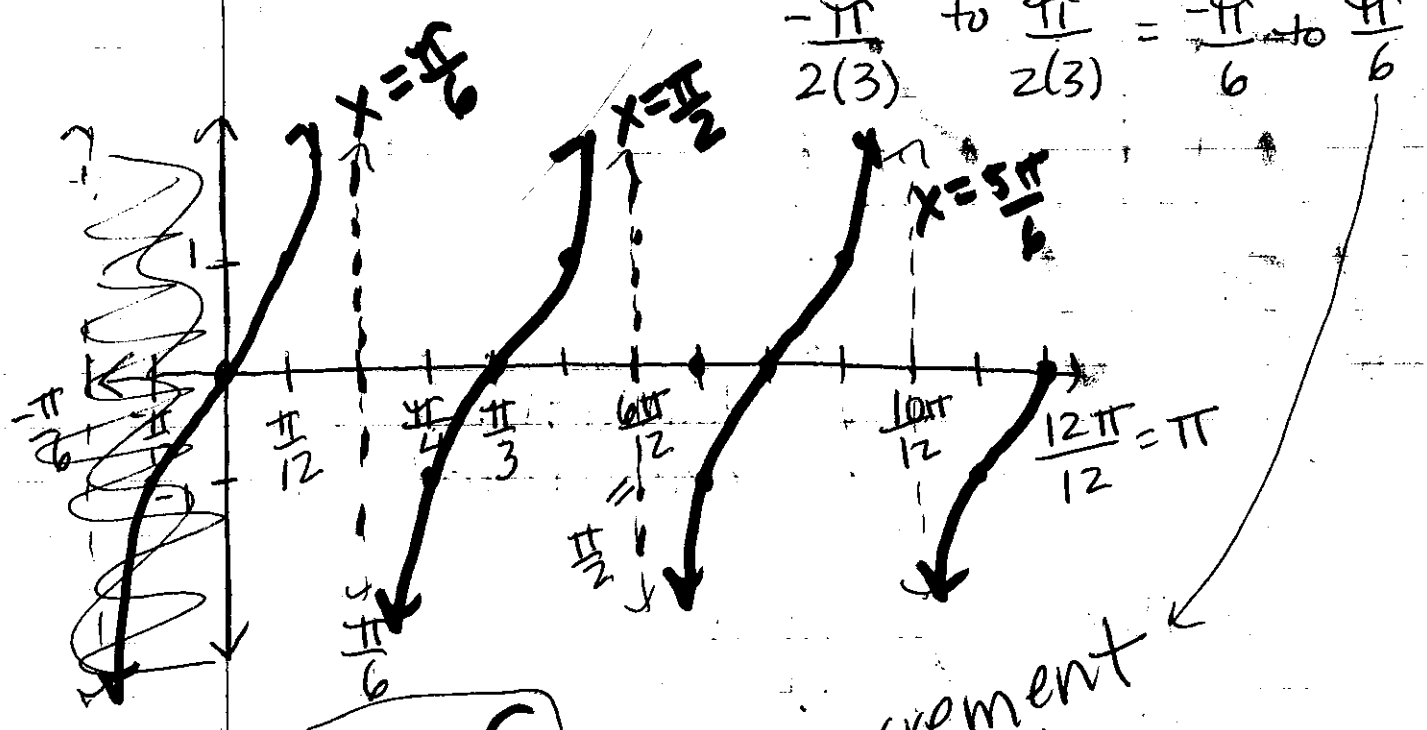
13.6 $y = a\tan b\theta$

(ex) $y = \tan 3\theta$, Graph $0 \le \theta \le \pi$

Period $= \frac{\pi}{b}$	$P = \frac{\pi}{3}$

1 cycle from $\frac{-\pi}{2b}$ to $\frac{\pi}{2b}$

$\frac{-\pi}{2(3)}$ to $\frac{\pi}{2(3)} = \frac{-\pi}{6}$ to $\frac{\pi}{6}$



increment take $\frac{1}{2}$

$\frac{1}{2} \cdot \frac{\pi}{6} = \frac{\pi}{12}$

Graph $0 \le \theta \le \pi$

window

X-min : 0
X-max : π
X-scale : π/12
Y-min : -4
Y-max : 4
Y scl = 1

table setup
tbl start : 0
ΔTBl : π/12 increment

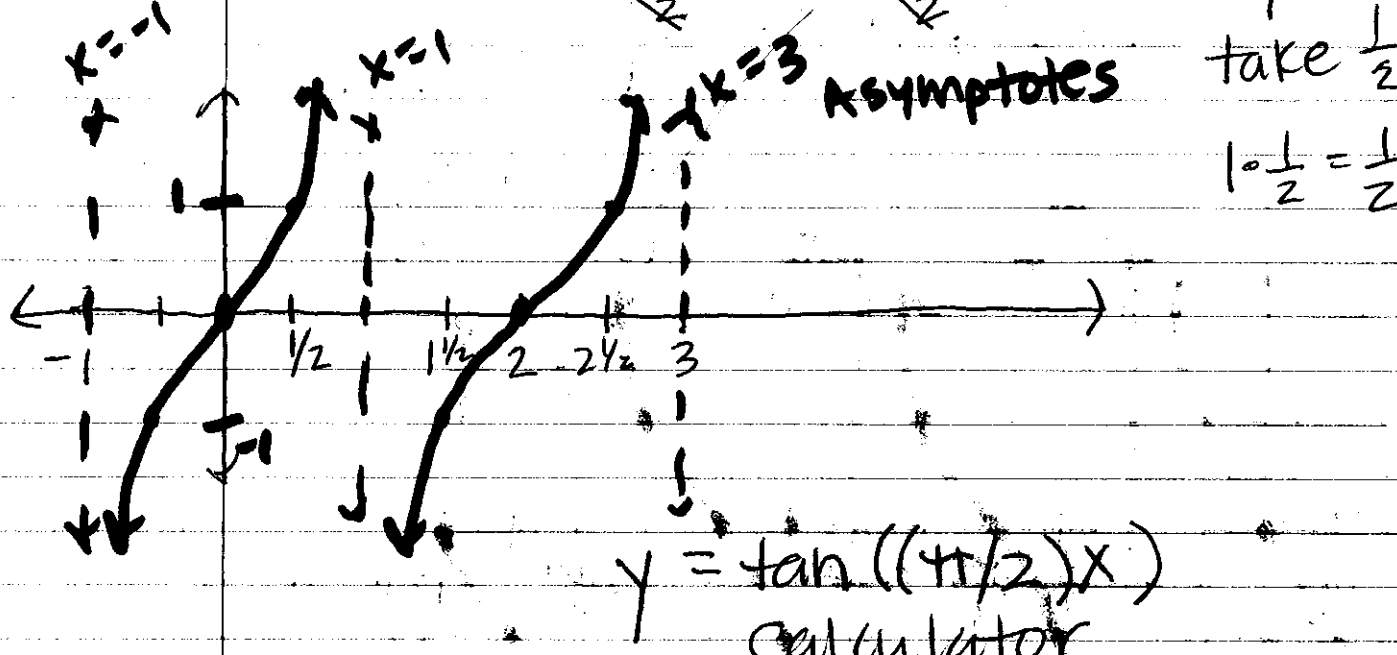
ex 2

(b) $y = \tan \frac{\pi}{2}\theta$, $0 \le \theta < 3$ ($b = \frac{\pi}{2}$)

$P = \frac{\pi}{\pi/2} = \pi \cdot \frac{2}{\pi} = 2$

cycles $= \frac{-\pi}{2 \cdot \frac{\pi}{2}}$ to $\frac{\pi}{2 \cdot \frac{\pi}{2}} = -1$ to 1

take $\frac{1}{2}$. $1 \cdot \frac{1}{2} = \frac{1}{2}$



p. 752

(16) $y = \tan 2\theta$ ($b = 2$, $\frac{\pi}{b} = P$)

$P = \frac{\pi}{2}$

cycles

$\frac{-\pi}{2(2)}$ to $\frac{\pi}{2(2)}$

$-\frac{\pi}{4}$ to $\frac{\pi}{4}$

Graph from 0 to 2π

increments $\frac{1}{2} \cdot \frac{\pi}{4} = \frac{\pi}{8}$