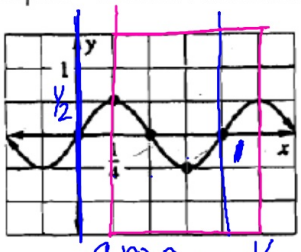
Algebra 2/Trig H **NOTES** **14.5 Modeling with Trigonometric Functions**

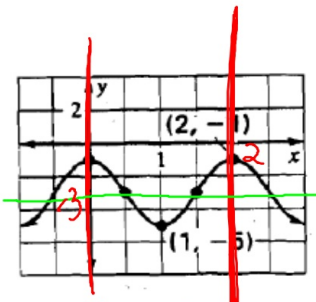
Sinusoids are graphs of sine and cosine functions.
The equations we will use are $y = a\sin b(x-h)+k$ and $y = a\cos b(x-h)+k$, where
$|a|$ is the amplitude, $\frac{2\pi}{|b|}$ is the period, h is the horizontal shift, and k is the vertical shift.

Examples: Write a function for each sinusoid.

1. 

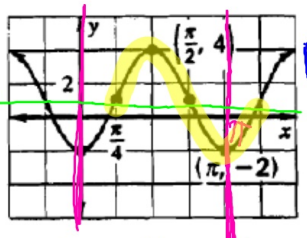
$y = \frac{1}{2}\cos 2\pi\left(x-\frac{1}{4}\right)$

amp = 1/2
per = 1, b = 2π
$y = \frac{1}{2}\sin 2\pi x$

2. 

K = −3
a = 2
per = 2, b = π
y = −3

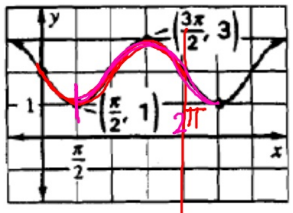
$y = 2\cos \pi x - 3$

3. 

per = π
b = 2
K = 1
a = 3

$y = -3\cos 2x + 1$

$y = 3\sin 2(x-\pi/4)+1$

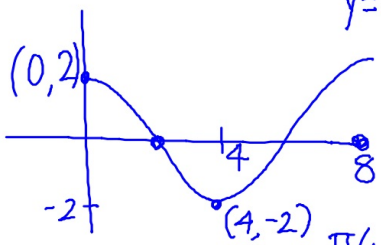
4. 

$y = -\sin x + 2$

$y = -\cos\left(x-\frac{\pi}{2}\right)+2$

5. maximum point at (0, 2)

minimum point at (4, -2)



$y = 2\cos\frac{\pi}{4}x$

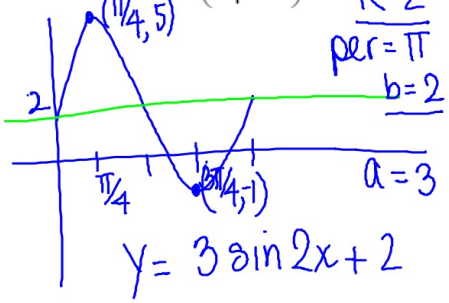
per = 8, $b = \pi/4$, $a = 2$

$\frac{2\pi}{b} = 8$

$\frac{2\pi}{8} = b$

6. maximum point at $\left(\frac{\pi}{4}, 5\right)$

minimum point at $\left(\frac{3\pi}{4}, -1\right)$



K = 2

per = π

b = 2

a = 3

$y = 3\sin 2x + 2$