APPLICATIONS OF TRIG FUNCTIONS AND THEIR GRAPHS

5. A small toy attached to the end of a slinky (or spring) bobs up and down according to an equation of the form $d = a\cos(bt)$. The motion of the toy starts at its highest position of 5 inches above its rest point, bounces down to its lowest position of 5 inches below its rest point, and then bounces back to its highest position in a total of 4 seconds. Write an equation that represents this motion.

A = 5 b = $\pi/2$

per = 4 = $\frac{2\pi}{b}$

$4b = 2\pi$

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

y = $5\cos\left(\frac{\pi}{2}x\right)$

6. The temperature in an office is controlled by an electronic thermostat. The temperatures vary according to the sinusoidal function:

$$y = 19 + 6\sin\left(\frac{\pi}{12}(x-11)\right)$$

$\sin\left(\frac{-\pi}{6}\right)$

$-\frac{1}{2}$

where y is the temperature (°C) and x is the time in hours past midnight.

19 - 3

a.) What is the temperature in the office at 9 A.M. when employees come to work? 16°

b.) What are the maximum and minimum temperatures in the office?

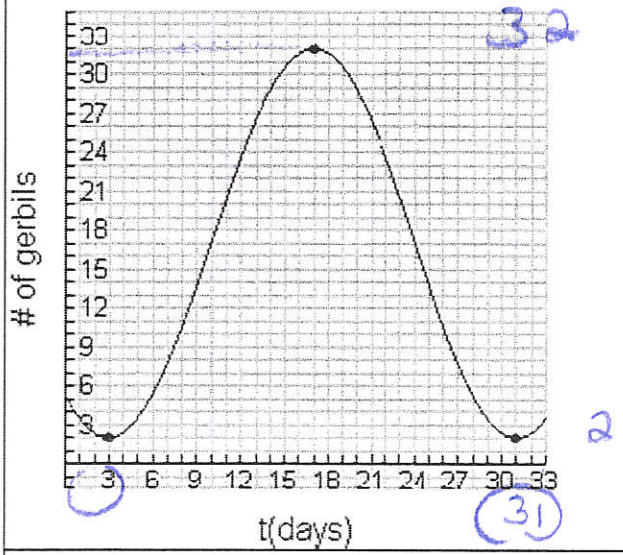
What is your K or D? 19°. This will be your new midline.

What is your A? 6 (Add and subtract from your midline to get your max and min)

25 and 13

PRECALC WRITING EQUATIONS OF TRIG FUNCTIONS

7. A pet store clerk noticed that the population in the gerbil habitat varied sinusoidally with respect to time, in days. He carefully collected data and graphed his resulting equation. From the graph, determine the amplitude, period, horizontal shift and vertical shift. Write the equation of the graph below.



32

2

31

$2 + 32 = \frac{34}{2}$

$K = 17$

$a = 15$

Period = 28	Amplitude = 15
Horizontal Shift = 3	Vertical shift = 17
Frequency: Period= $2\pi/B$= $\frac{2\pi}{b} = 28$ so B= $28b = 2\pi$, $b = \pi/14$	
Equation:	

$$y = -15\cos\left[\frac{\pi}{14}(x-3)\right] + 17$$