

Warm-up: Applications (Sinusoidal Functions as Mathematical Models)

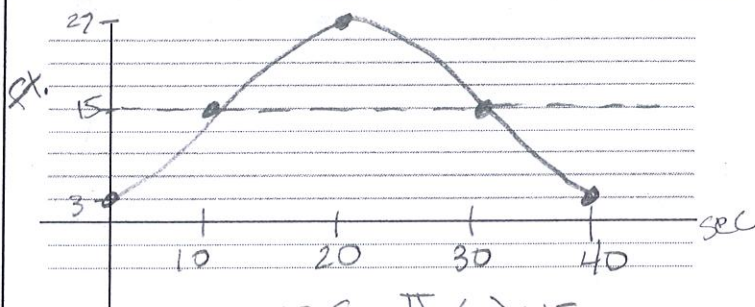
There is a kiddie Ferris wheel at the Cobb County Fair.

The radius of the wheel is 12 feet and it makes a complete revolution every 40 seconds. $P=40$

The bottom of the ride sits 3 feet above the ground on a platform.

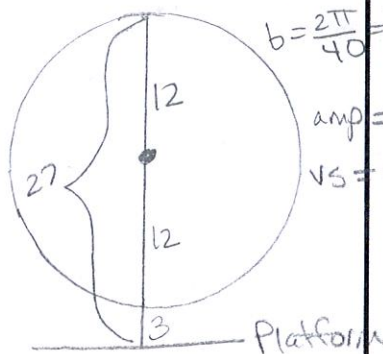
The height of a passenger on the ride is a function of time.

- 1) Sketch a graph that shows one period of function and write the Cosine equation of the function.



$$y = -12 \cos \frac{\pi}{20}(x) + 15$$

$$y = 12 \cos \frac{\pi}{20}(x - 20) + 15$$



$$\text{period} = 40$$

$$b = \frac{2\pi}{40} = \frac{\pi}{20}$$

$$\text{amp} = \frac{27-3}{2} = 12$$

$$VS = \frac{27+3}{2} = 15$$

- 2) How many seconds have you been on the ferris wheel when you first reach the top of the wheel?

20 seconds

- 3) After how many seconds will you first be at a height of 12 feet above the ground? Round to the nearest tenth.

graph $y=12$ 2nd Calc Intersection $x=8.4$ Seconds

- 4) How high will you be at 52 seconds? Round to the nearest tenth.

2nd Calc - Value $x=52$ $y=18.7$ ft.