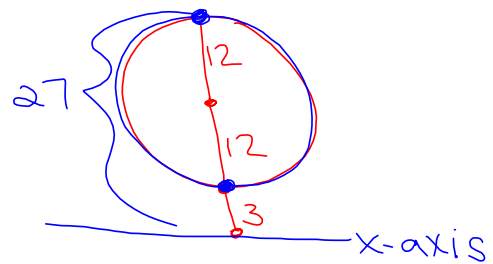
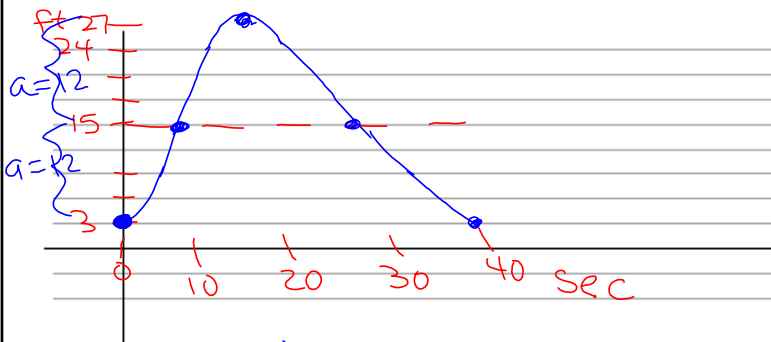


### Warm-up: Applications (Sinusoidal Functions as Mathematical Models)

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.  
 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.



$$\begin{aligned} \text{Period} &= 2\pi \\ 40 &= \frac{2\pi}{b} \\ 40b &= 2\pi \\ b &= \frac{2\pi}{40} \\ b &= \frac{\pi}{20} \end{aligned}$$

$$y = -12 \cos\left(\frac{\pi}{20}(x)\right) + 15 \quad \text{or} \quad y = 12 \cos\left(\frac{\pi}{20}(x-20)\right) + 15$$

- 2) How many seconds have you been on the ferris wheel when you first reach the top of the wheel?  
 20 sec.
- 3) After how many seconds will you first be at a height of 12 feet above the ground? Round to the nearest tenth.  
 8.4 sec.
- 4) How high will you be at 52 seconds? Round to the nearest tenth.  
 18.7 ft

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