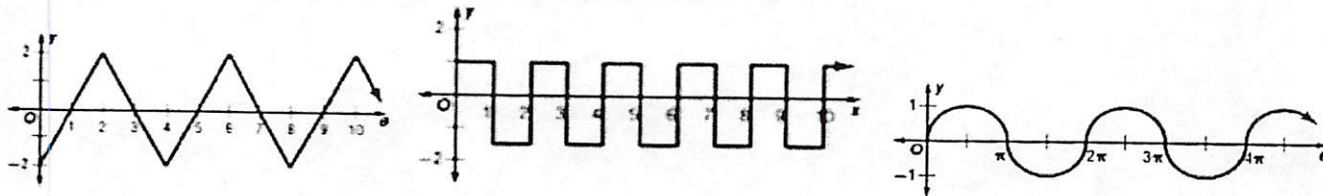


Notes Section 11.6

I can determine the period of a function given a graph.



I know how sine and cosine are related to a unit circle.

(See Unit Circle)

I can use the properties of periodic functions to find exact values for sine and cosine.

(See Unit Circle)

Section 11.7

I can determine the amplitude and period of sine and cosine functions.

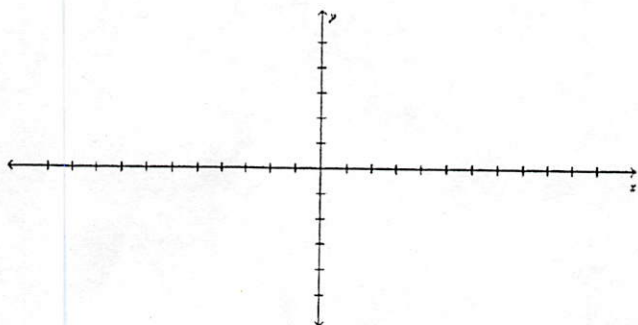
AMPLITUDE AND PERIOD

The amplitude and period of the graphs of $y = a \sin bx$ and $y = a \cos bx$, where a and b are nonzero real numbers, are:

$\text{Amplitude} = |a|$ $\text{Period} = \frac{2\pi}{|b|}$

I know the difference between a sine and cosine graph.

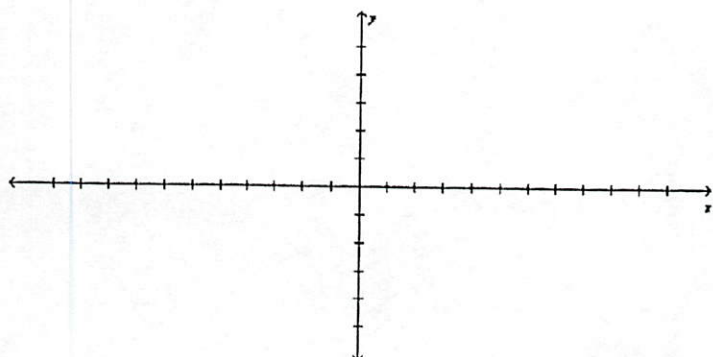
$y = \sin x$



Amplitude

Period

$y = \cos x$



Amplitude

Period

Determine the amplitude and period of each function:

1. $y = \sin 3x$
 Amplitude = _____
 Period = _____

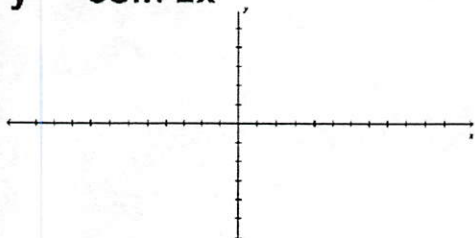
2. $y = -3\cos \frac{1}{2}x$
 Amplitude = _____
 Period = _____

3. $y = 2\cos 4x$
 Amplitude = _____
 Period = _____

I can graph sine and cosine functions.

I can identify the domain and range of sine and cosine functions.

$y = -3\sin 2x$



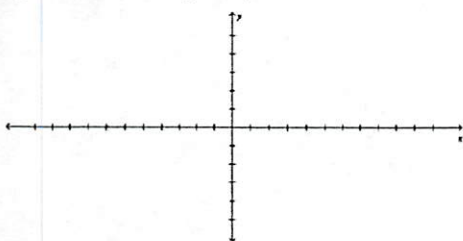
Amplitude

Domain:

Period

Range:

$y = 2\cos (1/2)x$



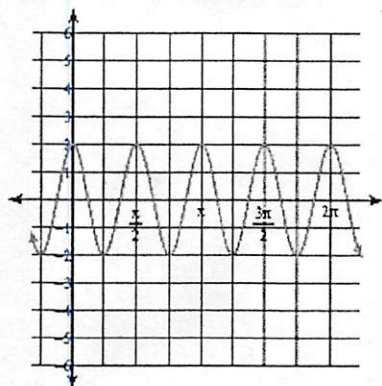
Amplitude

Domain:

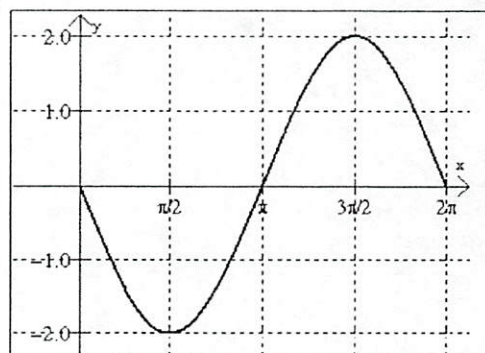
Period

Range:

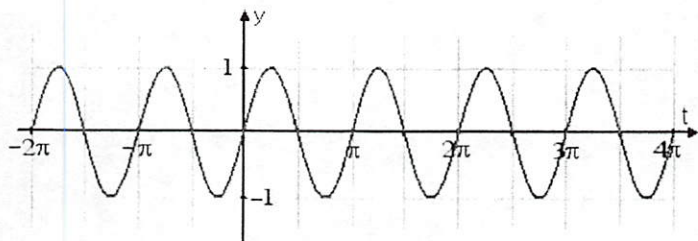
Give the amplitude and period of each function graphed below. Then write an equation of each graph.



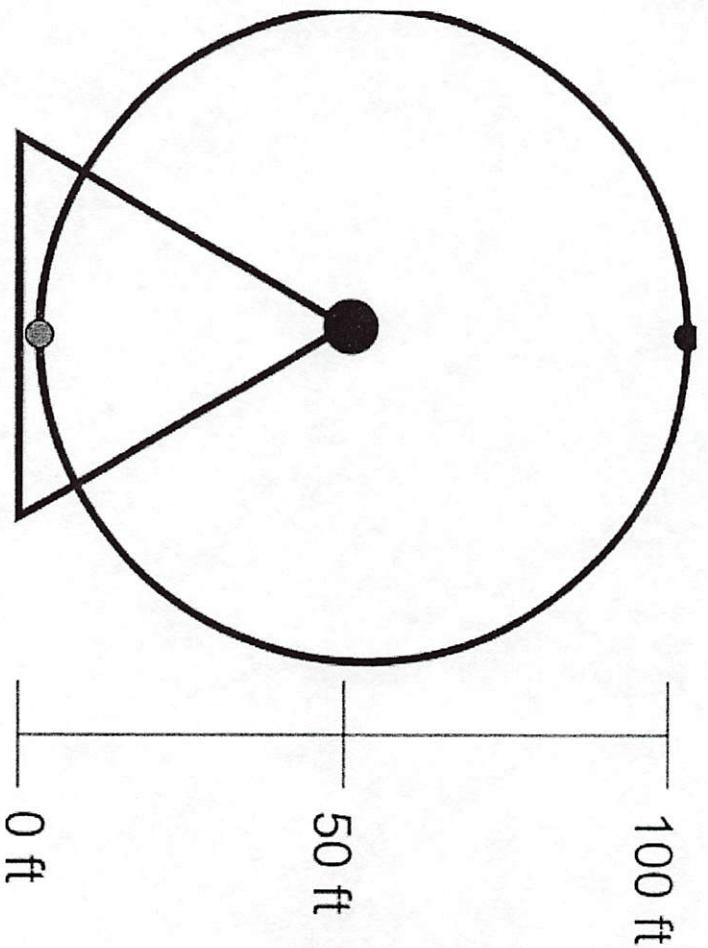
Amplitude: _____ Period: _____
 Equation: _____



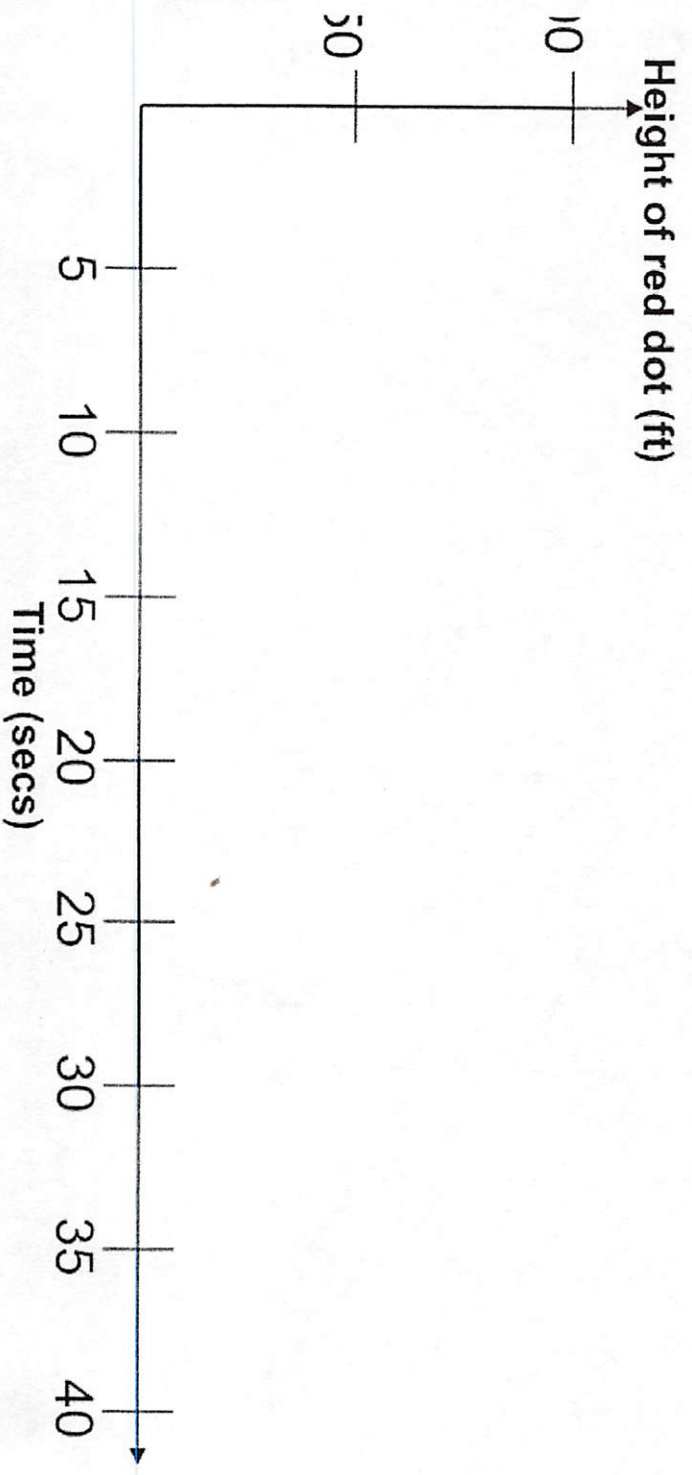
Amplitude: _____ Period: _____
 Equation: _____



Amplitude: _____ Period: _____
 Equation: _____



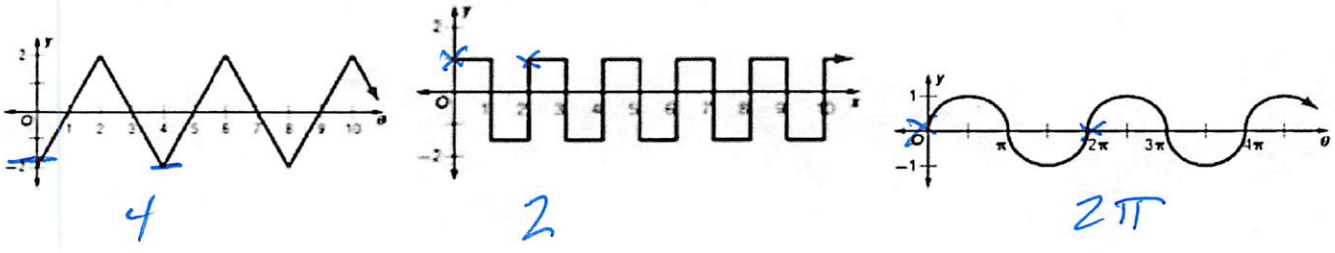
The model at left shows the height of your car (the red dot) while riding a 100-foot diameter Ferris Wheel that takes 20 seconds to complete a full rotation. Below, the height of the car is graphed as a function of time.



Key

Notes Section 11.6

I can determine the period of a function given a graph.



I know how sine and cosine are related to a unit circle.

(See Unit Circle)

I can use the properties of periodic functions to find exact values for sine and cosine.

(See Unit Circle)

Section 11.7

I can determine the amplitude and period of sine and cosine functions.

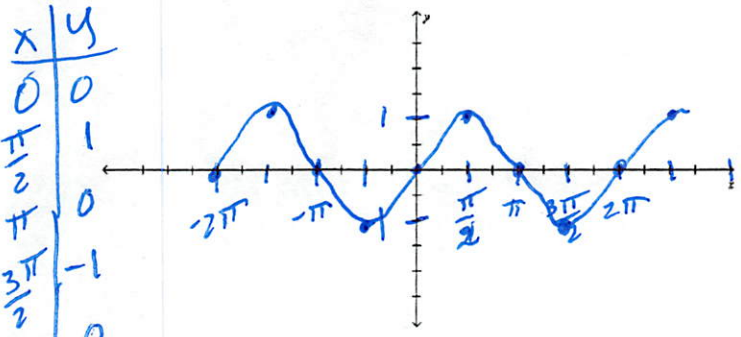
AMPLITUDE AND PERIOD

The amplitude and period of the graphs of $y = a \sin bx$ and $y = a \cos bx$, where a and b are nonzero real numbers, are:

Amplitude = $|a|$ Period = $\frac{2\pi}{|b|}$

I know the difference between a sine and cosine graph.

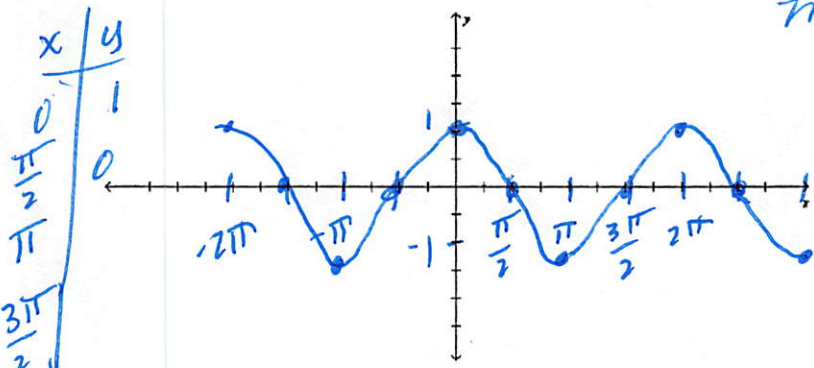
$y = \sin x$



4 critical points:
zero, max, zero, min

Amplitude 1 D: \mathbb{R}
Period 2π R: $[-1, 1]$

$y = \cos x$



4 critical points
max, zero, min, zero

Amplitude 1 D: \mathbb{R}
Period 2π R: $[-1, 1]$

Determine the amplitude and period of each function:

1. $y = \sin 3x$
 Amplitude = $\underline{1}$
 Period = $\underline{\frac{2\pi}{3}}$

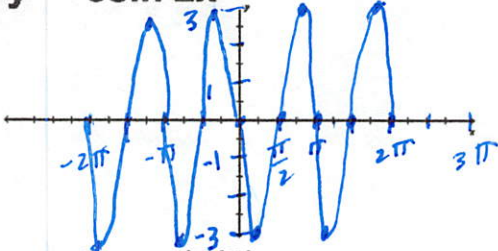
2. $y = -3\cos \frac{1}{2}x$
 Amplitude = $\underline{3}$
 Period = $\underline{\frac{2\pi}{1/2} = 4\pi}$

3. $y = 2\cos 4x$
 Amplitude = $\underline{2}$
 Period = $\underline{\frac{2\pi}{4} = \frac{\pi}{2}}$

I can graph sine and cosine functions.

I can identify the domain and range of sine and cosine functions.

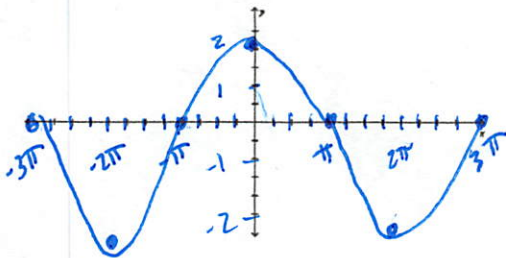
$y = -3\sin 2x$



Amplitude 3 Domain: \mathbb{R}
 Period $\frac{2\pi}{2} = \pi$ Range: $[-3, 3]$

Critical points
 $\frac{\text{Period}}{4} = \frac{\pi}{4}$

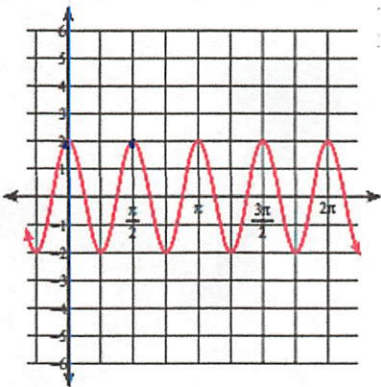
$y = 2\cos(1/2)x$



Amplitude 2 Domain: \mathbb{R}
 Period $\frac{2\pi}{1/2} = 4\pi$ Range: $[-2, 2]$

Critical points
 $\frac{4\pi}{4} = \pi$

Give the amplitude and period of each function graphed below. Then write an equation of each graph.

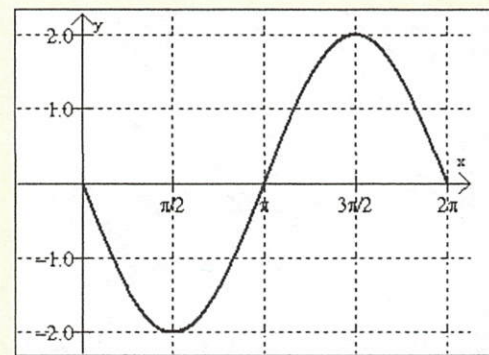


Starts at $(0, 2)$
 Cosine
 $y = a \cos bx$

Amplitude: $\underline{2}$ Period: $\underline{\frac{\pi}{2}}$
 Equation: $\underline{y = 2 \cos 4x}$

$\frac{2\pi}{b} = \frac{\pi}{2}$
 $\frac{2}{b} = \frac{1}{2}$

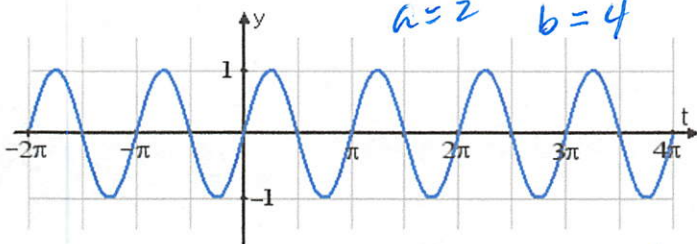
$a = 2$ $b = 4$



Starts at $(0, 0)$
 Sine

Amplitude: $\underline{2}$ Period: $\underline{2\pi}$
 Equation: $\underline{y = -2 \sin x}$

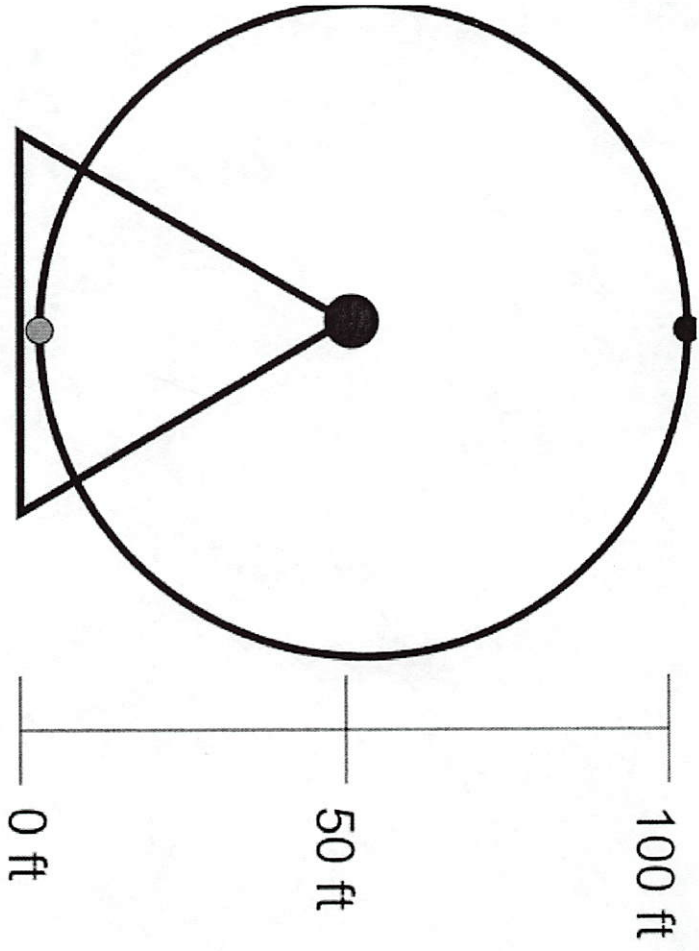
$y = a \sin bx$
 $a = 2$ $b = 1$
 reflected over x-axis
 (-2)



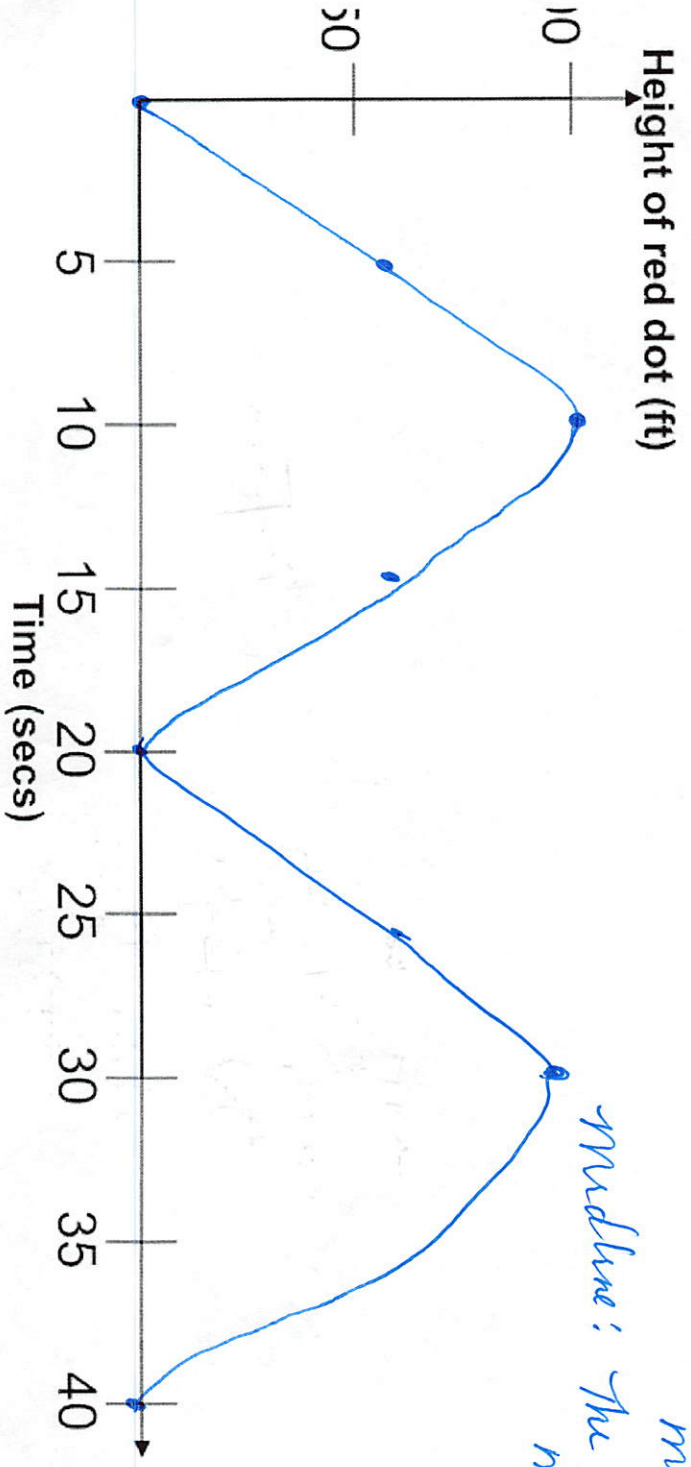
Amplitude: $\underline{1}$ Period: $\underline{\pi}$
 Equation: $\underline{y = \sin 2x}$

Starts at $(0, 0)$
 Sine
 $a = 1$ $b = 2$

$\frac{2\pi}{b} = \pi$
 $\frac{2}{b} = \frac{1}{1}$ $b = 2$



The model at left shows the height of your car (the red dot) while riding a 100-foot diameter Ferris Wheel that takes 20 seconds to complete a full rotation. Below, the height of the car is graphed as a function of time.



Periodic function: Repeats after a definite "period" or interval.

Period: length of the input interval it takes for output values to repeat.

Amplitude: the difference between the max or min and the midline.

Midline: the average between the max and the min.