

Are there any Homework Questions you would like to see on the board?

pp. 339-343 # 2 – 4, 6, 9, 12

Today's Learning Goal(s):

By the end of the class, I will be able to:

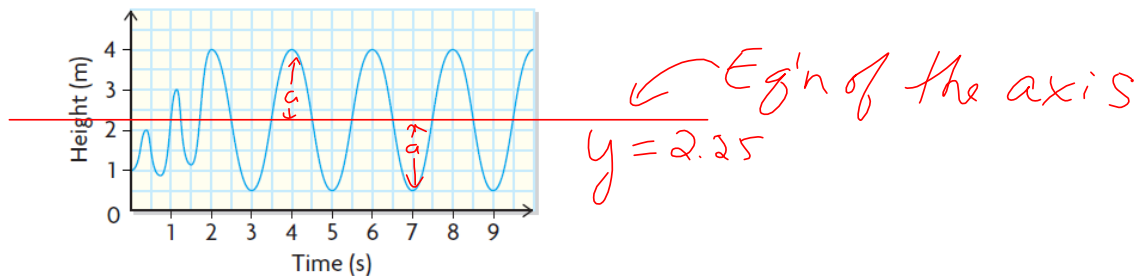
- a) relate details of sinusoidal phenomena to their graphs.

2d
3ab
4acd
6, 9, 12

BE READY for SWYK 6.1 Tomorrow!

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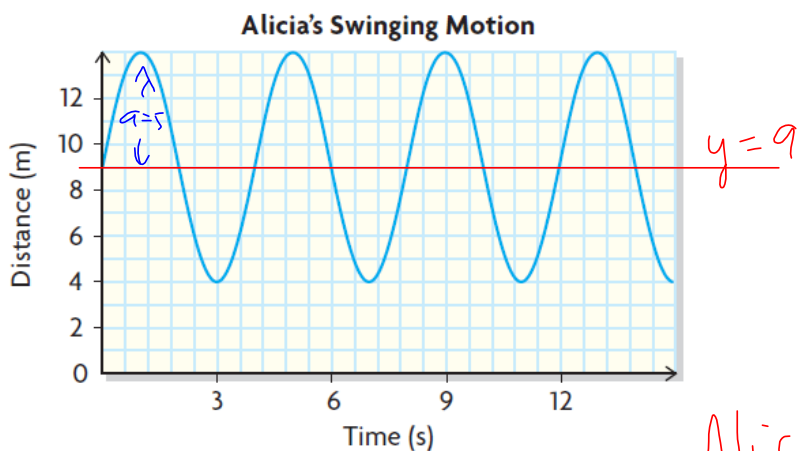
2. Nolan is jumping on a trampoline. The graph shows how high his feet are above the ground.



- a) How long does it take for Nolan's jumping to become periodic? What is happening during these first few seconds?
- b) What is the period of the curve? What does *period* mean in this context?
- c) Write an equation for the axis of the periodic portion of the curve.
- d) What is the amplitude of the sinusoidal portion of the curve? What does *amplitude* mean in this context?

$\hookrightarrow a = 1.75$
 \hookrightarrow Nolan is 1.75 m above the half way point of his jumping height

3. Alicia was swinging back and forth in front of a motion detector. Her distance from the motion detector in terms of time can be modelled by the graph shown.

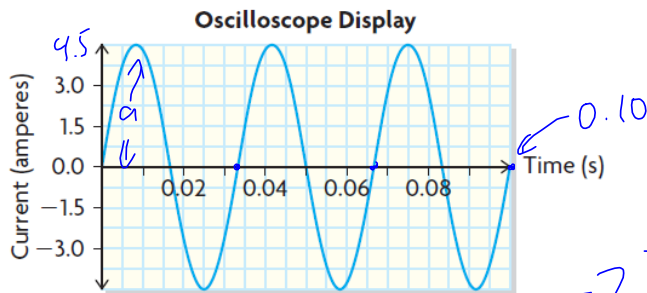


- a) What is the equation of the axis, and what does it represent in this situation?
- b) What is the amplitude of this function?

$a=5$ (5m)

\rightarrow Alicia is halfway thru her swing at 9m away from the sensor.
 Also, when at rest, she is 9m from the sensor
 \therefore Swing is attached 9m from the sensor.

p. 340 4. An oscilloscope hooked up to an AC (alternating current) circuit shows a sine curve on its display:



- a) What is the period of the function?
- b) What is the equation of the axis of the function?
- c) What is the amplitude of the function? $a = 4.5$ amps
- d) State the units of measure for each of your answers above.

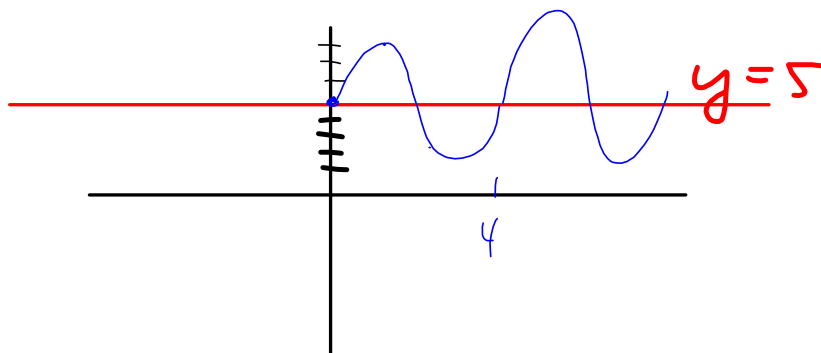
$3 \text{ cycles} = 0.10 \text{ Sec}$
 $\therefore 1 \text{ cycle (1 period)} = \frac{0.10}{3}$
 $= 0.033 \text{ Sec}$

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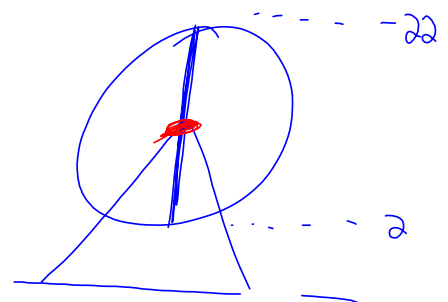
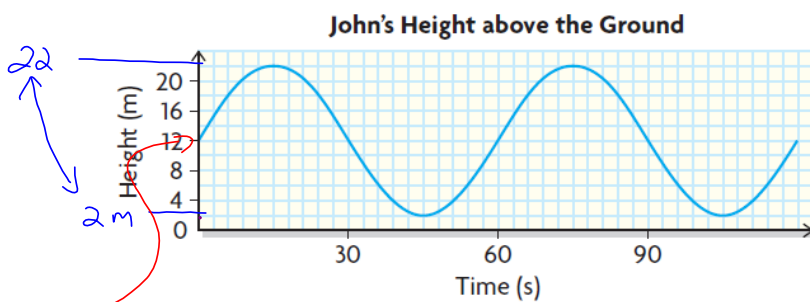
6. Sketch the sinusoidal graphs that satisfy the given properties.

	Period (s)	Amplitude (m)	Equation of the Axis	Number of Cycles
a)	4	3	$y = 5$	2
b)	20	6	$y = 4$	3
c)	80	5	$y = -2$	2

a)



- p. 343 9. The graph shows John's height above the ground as a function of time as he rides a Ferris wheel.



- a) What is the diameter of the Ferris wheel? $22 - 2 = 20\text{ m}$
 b) What is John's initial height above the ground? 12 m
 c) At what height did John board the Ferris wheel? 12 m
 d) How high above the ground is the axle on the wheel?

← eq'n of the axis
 $\therefore y = 12$ (or 12 m above)

Aside:

$$\begin{aligned}
 y &= \frac{hi + lo}{2} \\
 &= \frac{22 + 2}{2} \\
 &= \frac{24}{2} \\
 &= 12
 \end{aligned}$$

p. 343 *Enrichment*

12. a) Create a table of values for the function defined by $f(\theta) = \tan \theta$, where $0^\circ \leq \theta \leq 360^\circ$.

Rotation (θ)	0°	30°	60°	90°	120°	•••	330°	360°
$\tan \theta$	0							

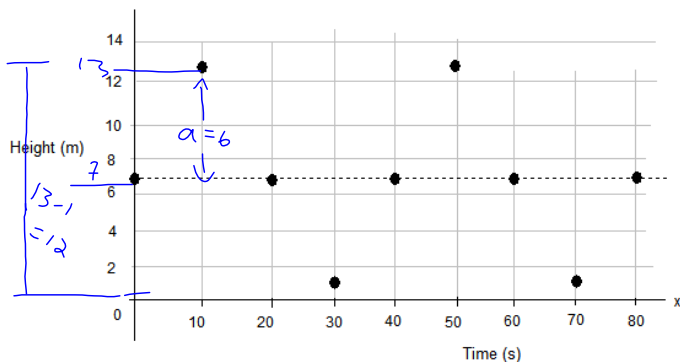
- b) Plot these points, and draw a curve.
c) Is this a sinusoidal function? Explain.
d) Determine the period, the equation of the axis, and the amplitude of the function.

6.4 Comparing Sinusoidal Functions

Date: NOV. 21 / 19

Ex. 1: Complete the table.

Ferris Wheel A



Period = 40 s

Equation of the Axis: $y=7$

Amplitude = 6

Circumference of the Ferris Wheel = 37.70 m

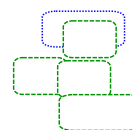
$$C = 2\pi r$$

$$= 2\pi(6)$$

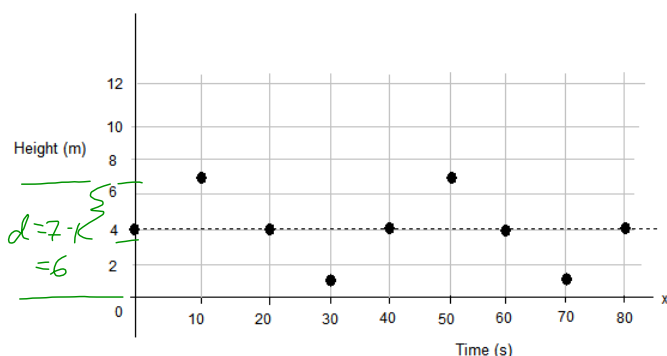
$$= 37.699$$

$$\approx 37.70 \text{ m}$$

Period = 40 s



Ferris Wheel B



Equation of the Axis: $y=4$

Amplitude = 3

Circumference of the Ferris Wheel = 18.85 m

$$C = 2\pi r$$

$$= 2\pi(3)$$

$$= 18.849$$

$$\approx 18.85 \text{ m}$$

Ex. 2: How do we interpret the following information about the Ferris wheel?

a) period for Ferris Wheel A, Ferris Wheel B

the time for 1 complete rotation

b) equation of the axis $\frac{\text{max} + \text{min}}{2}$

↳ height of the axle

c) amplitude for each Ferris Wheel

$a = \text{max} - \text{eq'n of the axis}$

OR

$\frac{\text{max} - \text{min}}{2}$

Ex. 3: Calculate the speed at which each wheel is travelling.

$$\text{Speed}_A = \frac{37.70 \text{ m}}{40 \text{ s}}$$

$$\approx 0.942$$

$$\approx 0.94 \text{ m/s}$$

$$\text{Speed}_B = \frac{18.85 \text{ m}}{40 \text{ s}}$$

$$\approx 0.471$$

$$\approx 0.47 \text{ m/s}$$

$$s = \frac{d}{t} = \frac{\text{circumference}}{\text{period}}$$

0.94 m/s

0.47 m/s

BE READY FOR SWYK TOMORROW

Today's Homework:

pp. 348-350 # 1 – 3, 7 AND
READ pp. 355-356 AND
pp. 357-358 # 1 – 4, 6 – 8