Date: _____

Today's Learning Goal(s):

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

a) solve problems related to real-world applications of sinusoidal functions.
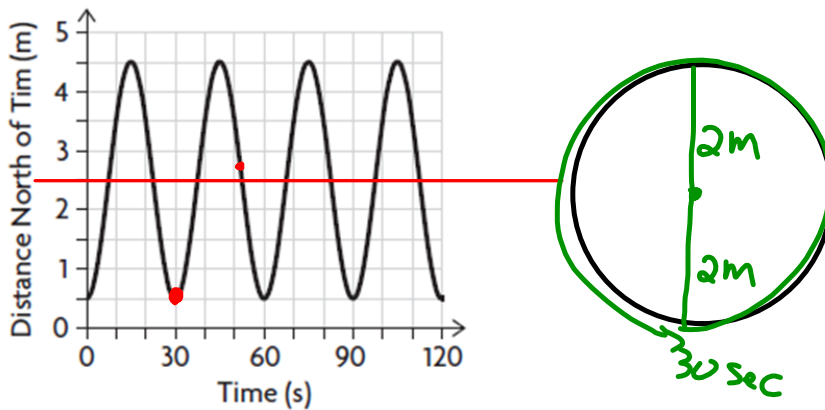
"Show What You Know" 6.2 is Today

Last day's work: pp. 391-393 #1 – 6, 9, 12 [13,14]

6.7 Solving Problems Using Sinusoidal Models

Date: _May 23/18_

Ex. 1 Tim has a model train that goes around a circular train track, and Tim is standing directly south of the track. The graph below shows the train's distance north of Tim as a function of time.

a) What is the equation of the axis of the function? $y = 2.5$

b) What is the amplitude of the function, $a = 2$; the radius of the track
and what does it represent in this situation??

c) What is the period of the function,   30 s; time for 1 lap around the track
and what does it represent in this situation??

d) What is the range of the function? $\{y \quad \mathbf{R}/0.5 \le y \le 4.5\}$

e) Determine the ^{an} equation of the sinusoidal function. $y = -2\cos(12x) + 2.5$

f) What is the train's distance north of Tim at $t = 52$ s?

Sub $t = 52$ s in equation above, then $y = 2.709$ m

e) start at $t = 30s$

$$y = -2\cos\left(12(t-30)\right) + 2.5$$

$$k = \frac{360}{30} \leftarrow \text{period}$$

$$= 12 \cdots$$

f) if $t = 52$

$$y = -2\cos\left((12(52-30))\right) + 2.5$$

$$= -2\cos\left(12(22)\right) + 2.5$$

$$= -2\cos(264) + 2.5$$

$$\doteq 2.709 \text{ m}$$

Ex. 2

A Ferris wheel with radius 20 metres rotates once every 40 seconds.
Passengers get on at the bottom of the wheel, which is 1 metre off the ground.
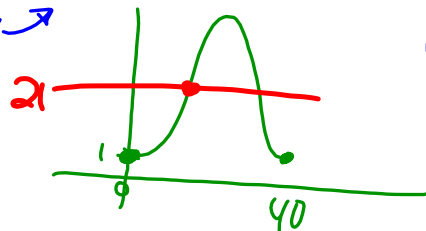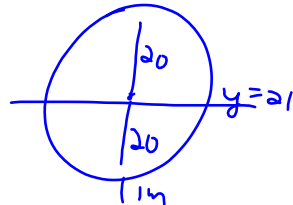Suppose you get on, and the wheel starts to rotate.

a) Write a sinusoidal equation which expresses your height as a function of elapsed time.

$a = 20$ (radius)

period $= 40$ sec

$C = 21$ ∴ $y = 21$ ↗

$k = \dfrac{360}{40}$

$= 9$

$h(t) = -20\cos(9t) + 21$

$y = -20\cos\big(9(t-0)\big) + 21$

$= -20\cos(9t) + 21$

b) Calculate your height after 15 seconds.   35.14 m

if $h(15) = -20\cos(9(15)) + 21$

$t = 15$ sec $= -20\cos(135) + 21$

$\doteq 35.14$

c) If you are on the Ferris wheel for 5 minutes, how many complete rotations
will you have completed?

5 min

$= 300$ sec

$\dfrac{300}{40}$

$= 7.5$

(7.5)

7 **complete** rotations

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

Last day's work: pp. 391-393 #1 – 6, 9, 12 [13,14]

Today's Homework Practice includes:
pp. 398-401 #1 – 4, 6, 7, 9 [13]

Tomorrow's Review:
pp. 404-405 #1 – 3, 6, 8 – 10, 12, 13