Today's Learning Goal(s):

Date: _____

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

a) solve problems related to real-world applications of sinusoidal functions.

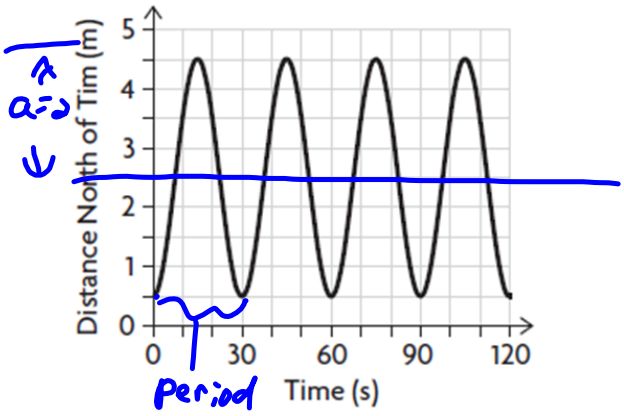
"Show What You Know" 6.2 is Today

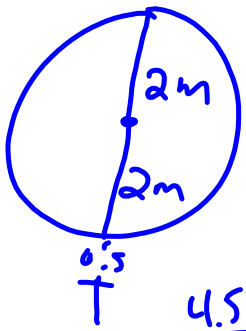
Last day's work: pp. 391-393 #1 – 6, 9, 12 [13,14]

6.7 Solving Problems Using Sinusoidal Models

Date: DEC.10/15

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, and what does it represent in this situation?? a = 2; the radius of the track

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

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

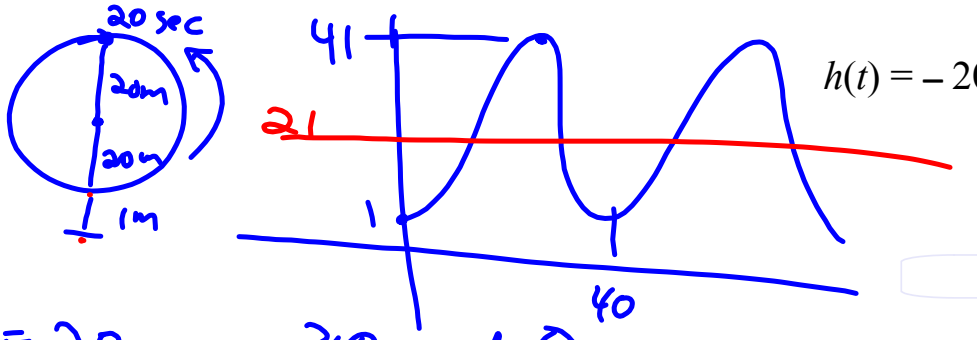
e) Determine the equation of the sinusoidal function. $y = -2\cos(12x) + 2.5$

f) What is the train's distance north of Tim at $t = 52$ s? 2.709 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.



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

$a = 20$ $\quad k = \frac{360}{40} = 9$ $\quad d = 0$ $\quad c = 21$

b) Calculate your height after 15 seconds.

$h(15) = -20\cos(9 \times 15) + 21$ → 35.14 m

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

5 min = 300 sec
(x60)

$\therefore \frac{300}{40}$

$= 7.5$

(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