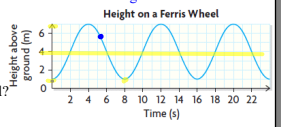
Unit 5, Lesson 4: Interpreting Sinusoidal Functions

Sinusoidal functions can be used model periodic phenomena. Each characteristic or property of the graph is related to the situation that it is modelling

Ex 1) The graph shows Raymond'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?

6m

b) What is Raymond's initial height above the ground?

1m.

c) How high above the ground is the axle on the wheel?

4m

d) How long does it take for Raymond to complete one revolution of the Ferris wheel?

8 seconds

e) What is the speed of the Ferris wheel? What assumption(s) are you making about the Ferris wheel when you calculate its speed?

speed = $\frac{\text{distance}}{\text{time}}$

$= \frac{18.84\text{m}}{8\text{ sec}}$

Speed = 2.36 m/sec

circumference = $2\pi r$

$= 2\pi(3)$

$= 18.84\text{m}$

f) Determine his height above the ground 61s after the ride began.

$\frac{61}{8} = 7.625$ revolutions

↑ 7 complete revolutions, and then some "times around the circle"

7 x 8 = 56 sec

61 − 56 = 5 sec.

↑ now read the height off the ground

= 6m above the ground.

May 11-2:13 PM

Ex 2) Annette's shop teacher was discussing table saws. The teacher produced two different graphs for two different types of saw. In each case, the graphs show the height of one tooth on the circular blade relative to the cutting surface of the saw in terms of time.

Table Saw A

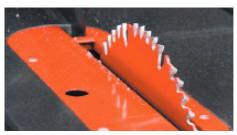


Table Saw B

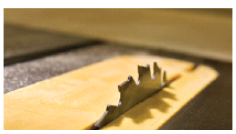


Table Saw A

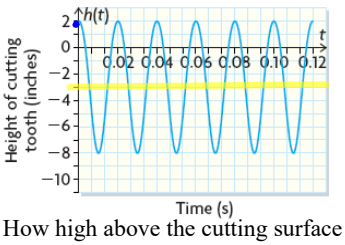
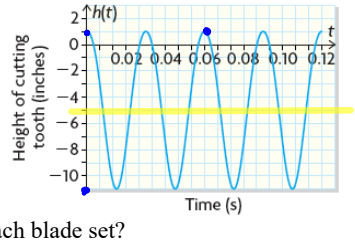


Table Saw B



a) How high above the cutting surface is each blade set?

2" 1"

b) What is the radius of each blade?

5" 6" (amplitude)

c) Where is the axle of the blade?

−3" (3" under the table) 5" under the table

d) How long does it take for each blade to complete one revolution?

0.02 seconds (1 period) 0.03 seconds

May 13-10:52 PM

HW U5L4:

1. p. 355 #8efg, 11

2. p. 370 #1, 4, 6, 8, 13 *(1e - yes, it's 14m away, 6d - the graph is wrong, 8a - y axis is wrong, should be a min of 0 and max of 52)*

3. sign and correct tests.