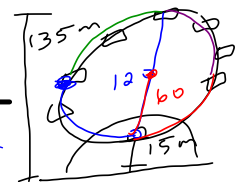
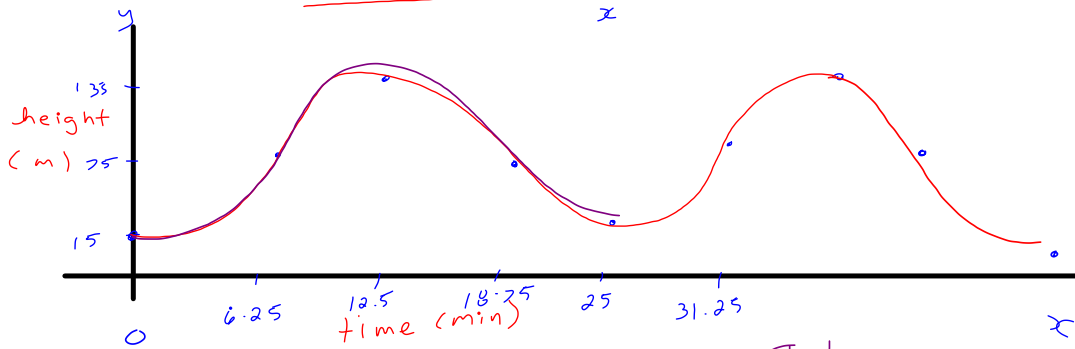


Lesson Eight: Periodic Functions

height of rider
as function of time

y as a function of x



Do page #1

25 mins
to go
around

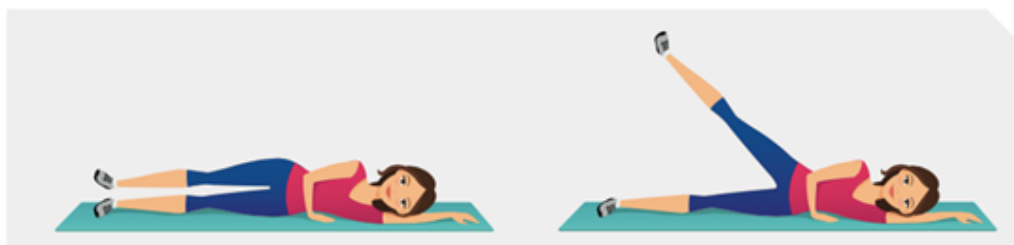
Definitions:

- Periodic Functions is a graph that repeats the same pattern/cycle.
- a cycle - one full revolution
 - the smallest ^{same} pattern that gets repeated

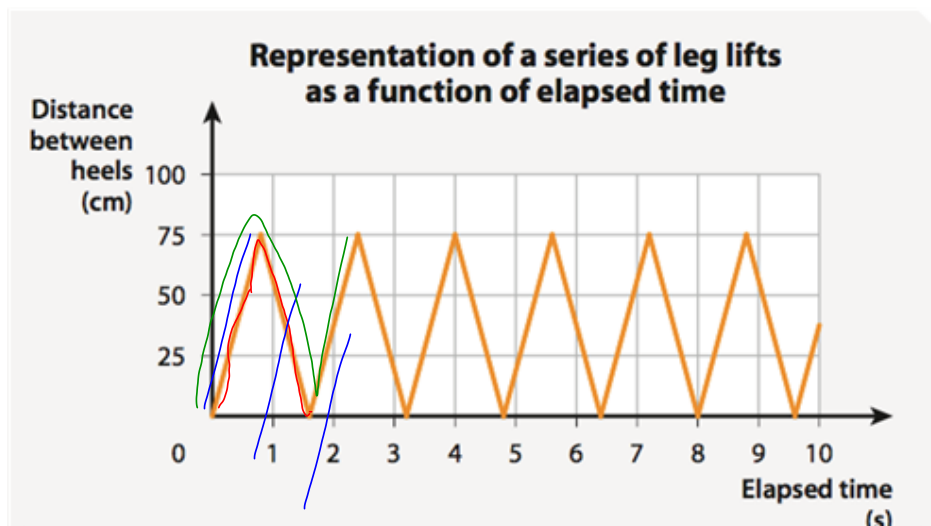
Example 1:

The side-lying leg lift is an exercise that helps strengthen the thigh and hip muscles.

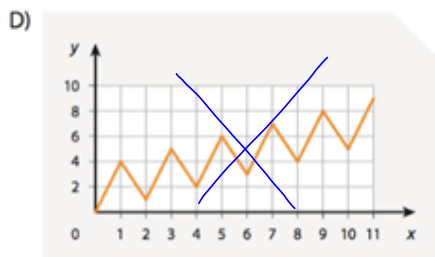
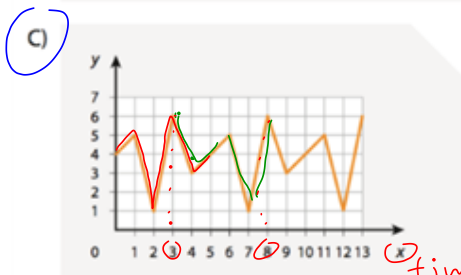
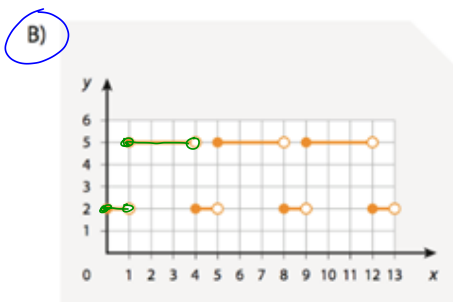
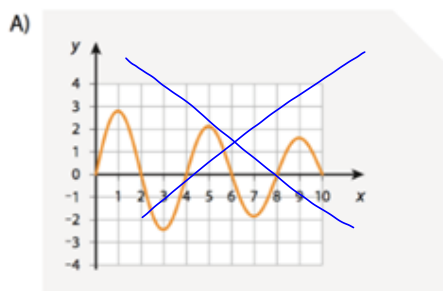
Pg 3
Do #2



The following graph shows how this exercise could be modelled.



Question 2: Circle following graphs that represent a periodic function? AND highlight one complete cycle in the graphs you identified.



5 mins
 $8 - 3 = 5 \text{ mins}$ } Periodic
 @ time min

Definition:

The Period: how long one cycle takes
 the horizontal length of one cycle
 $d = |x_2 - x_1|$

step i.
 highlight one cycle

step ii. use

$$P = |x_2 - x_1|$$

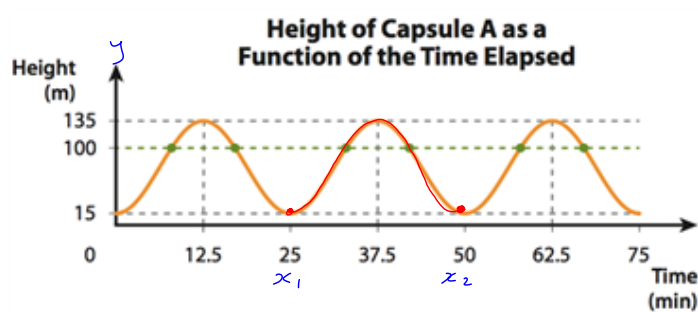
$$P = |50 - 25|$$

$$P = 25 \text{ mins}$$

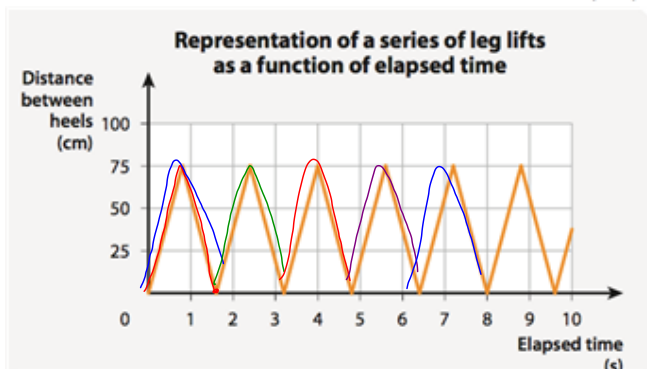
$$P = \frac{\text{a given length}}{\# \text{ of cycle}}$$

$$P = \frac{8 \text{ s}}{5 \text{ cycles}}$$

$$P = 1.6 \text{ s/cycle}$$



Do pg
 4
Question 3



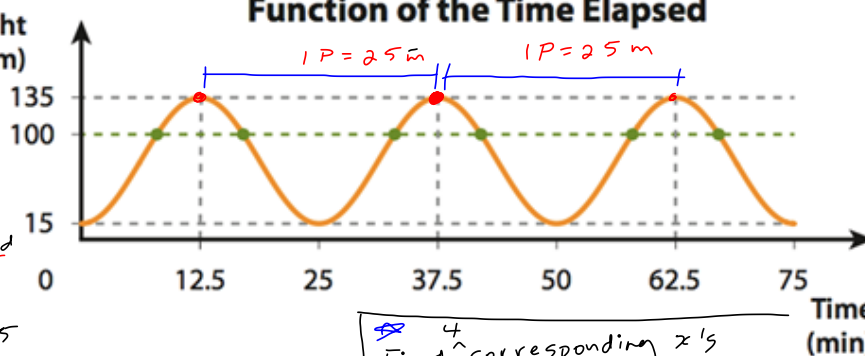
ANS
 d) 5 units

UNDERSTANDING CORRESPONDING ELEMENTS OF THE DOMAIN (X) AND THEIR IMAGE (Y) UNDER THE FUNCTION

Example 2: The graph below represents the height of a rider on the London Eye Ferris wheel as a function of time. A thrill-seeker steps into Capsule A and goes around 3 times.



Height of Capsule A as a Function of the Time Elapsed



Definition:
corresponding
x-values:

ex { 12.5, 37.5, 62.5 }

- the x-values in same position in a cycle.

x-values separated by a period

$$12.5 \neq 37.5 \neq 62.5$$

$$x \neq x + P \neq x + 2P$$

$$f(x) = f(x + P) = f(x + 2P) = 135 \text{ m}$$

└ Periods

Find 4 corresponding x's of 50 minutes
find the height @ those times

Hmwk: Pg 38 #1 P 44 #1
Pg 39 #2 #5 Pg 45 #6 a) c)
Pg 34 #5