UNIT 4: TRIGONOMETRY (WEEK 3)
DAY 1: THE GENERAL FORMULA

In General:

Ex. 1) Use mapping to find the critical points for the following equations.

a)

b)

c)

d)

Ex. 2) Graph using mapping.

a) $y = 2\sin x + 3$

b) $y = 3\sin 2(x - \pi/2)$

c) $y = 0.5\cos(x + \pi/2)$

d) $y = 4\cos(\frac{1}{2}x + \pi/4)$

Ex. 3) Determine the amplitude, period, vertical translation and phase shift for each.

a) $y = \sin x + 4$

b) $y = -2\cos 3(x + \pi/4) + 5$

c) $y = 4\cos 1/2(x + 3\pi) - 4$

d) $y = 2\sin(3x + \pi) + 4$

Ex. 4) Write an equation for the function with the given information.

a)

sine function
a = 6
prd = 2π
vt = -4
phs = $\pi/2$ left

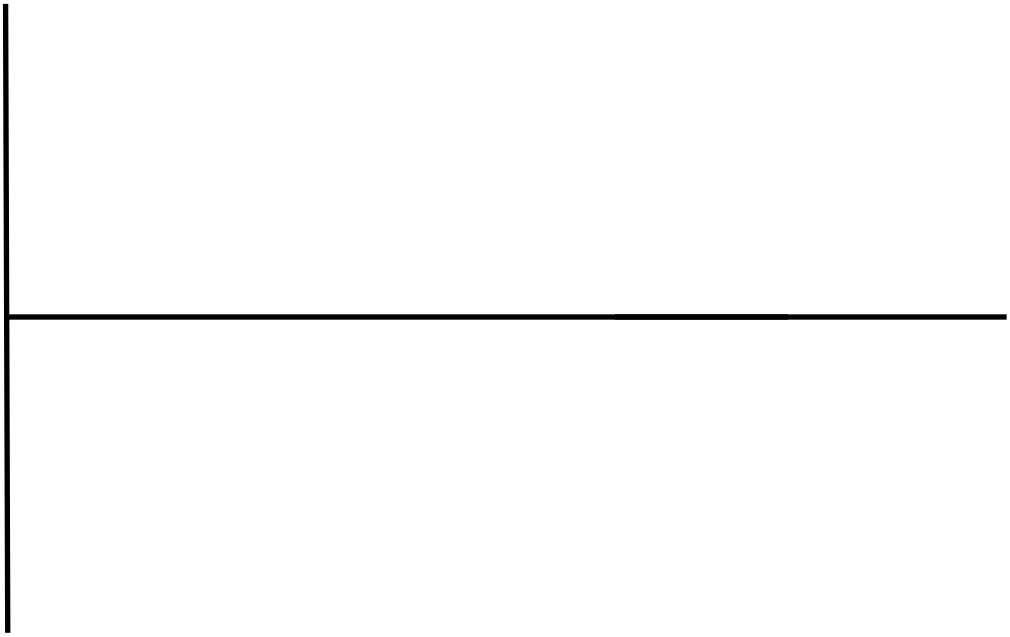
b)

cosine function
a = -2
prd = $\pi/2$
vt = none
phs = π right

DAY 2: APPLICATIONS OF TRIGONOMETRIC GRAPHS

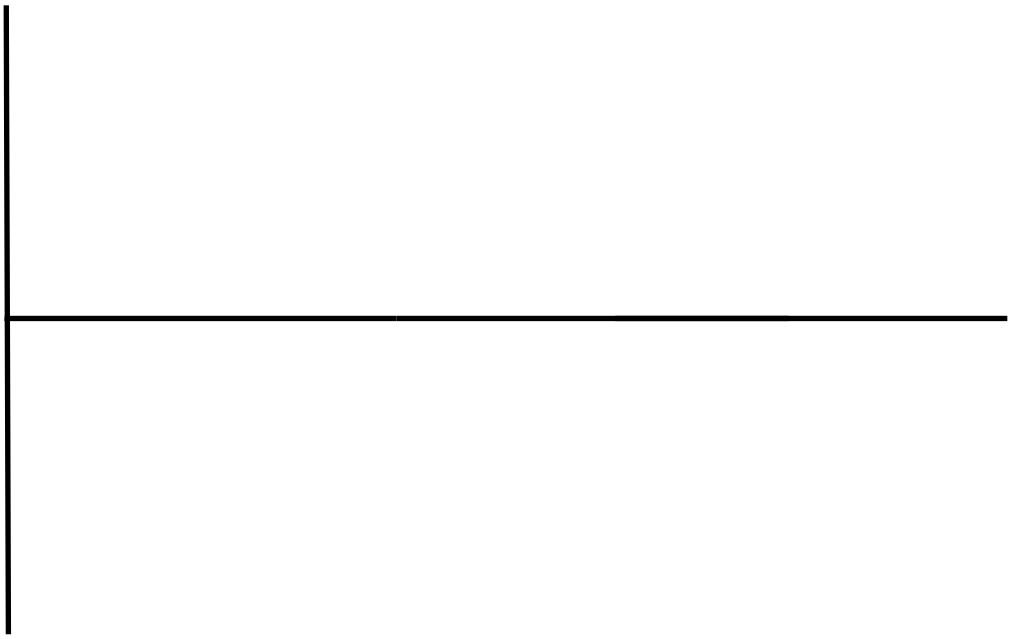
Ex. 1) The alternating half-daily cycles of the rise and fall of oceans are called tides. Tides in one section of the Bay of Fundy caused water to rise 6.5 m above average sea level and to drop 6.5 m below. The tide completes one cycle every 12 hours. Assuming the height of water with respect to average sea level to be modelled by a sine function,

A) draw a graph for a 24 hr period.
B) Find an equation of the graph in a.

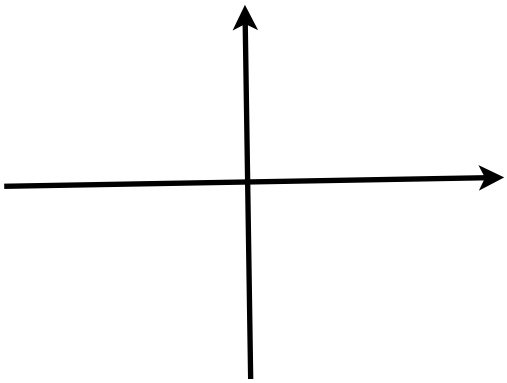


Ex. 2) A carnival ferris wheel with a radius of 7m makes one complete revolution every 16 s. The bottom of the wheel is 1.5 m above the ground.

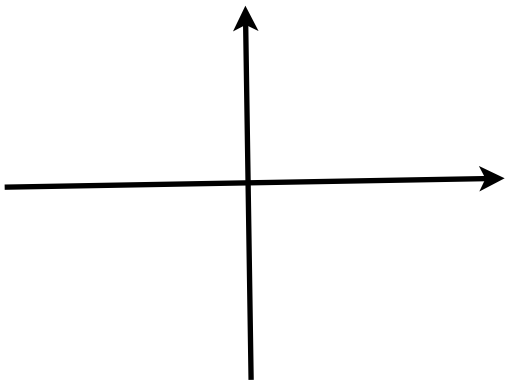
A) draw a graph to show how a person's height above the ground varies with time.
B) Find an equation of the graph in (a).



DAY 3: REVIEW



RADIAN:



POSITIVE ROTATION:

NEGATIVE ROTATION:

CONVERTING DEGREES ---> RADIANS

Ex) 90°

CONVERTING RADIANS ---> DEGREES

Ex) $2\pi / 3$

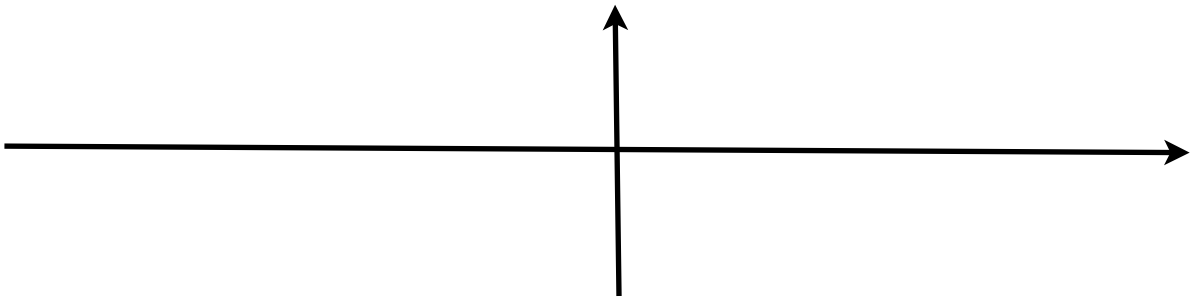
Ex) 2.14 rad

ARC LENGTH FORMULA

$$\Theta = a / r$$

$$a = \Theta \times r$$

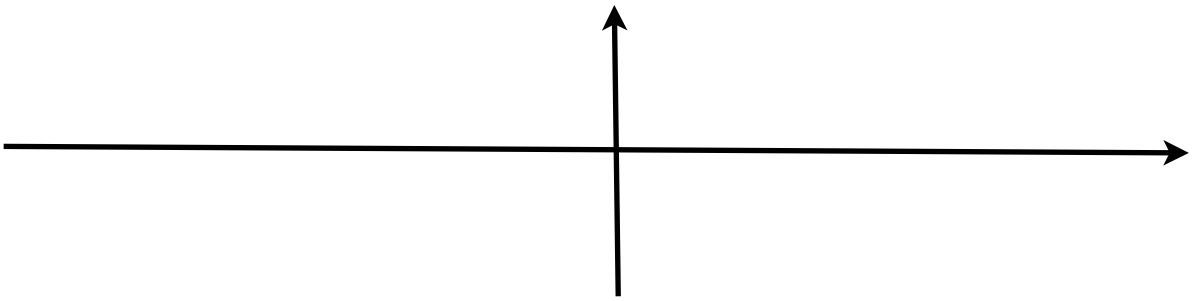
SINE WAVE



Points:

PRD:

COSINE WAVE



Points:

PRD:

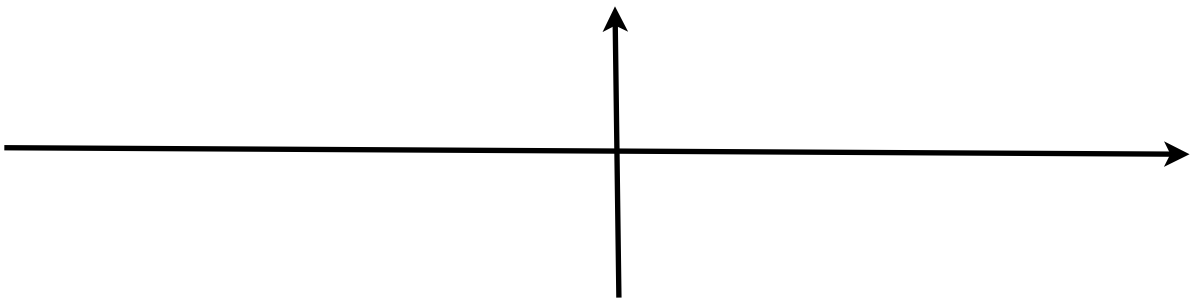
TRANSFORMING TRIG. FUNCTIONS

MAPPING

Ex) $y = 2\sin 3\theta$

Ex) $y = 4\cos(\frac{1}{2}\theta + \pi / 4) - 1$

Graph: $y = 4\cos(\frac{1}{2}\theta + \pi / 4) - 1$



TRIG. APPLICATIONS:
- Tides
- Ferris Wheel