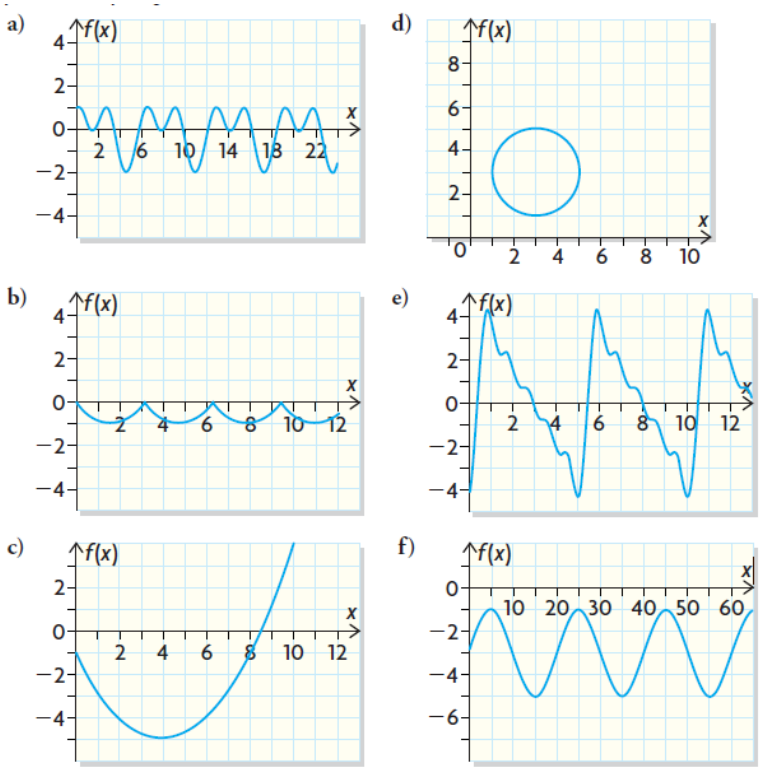
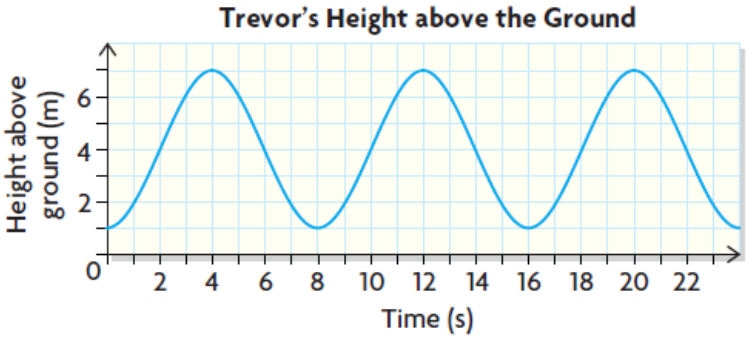
First name: _____ Last name: _____ Student ID: _____

Trigonometric Functions (2) Homework

1. Identify which graphs are periodic and sinusoidal. Estimate the period of the functions that you identify as periodic.



2. While riding on a Ferris wheel, Trevor's height above the ground in terms of time can be represented by the graph shown.



a) What is the period of this function, and what does it represent?

b) What is the equation of the axis?

c) What is the amplitude?

d) What is the range of the function?

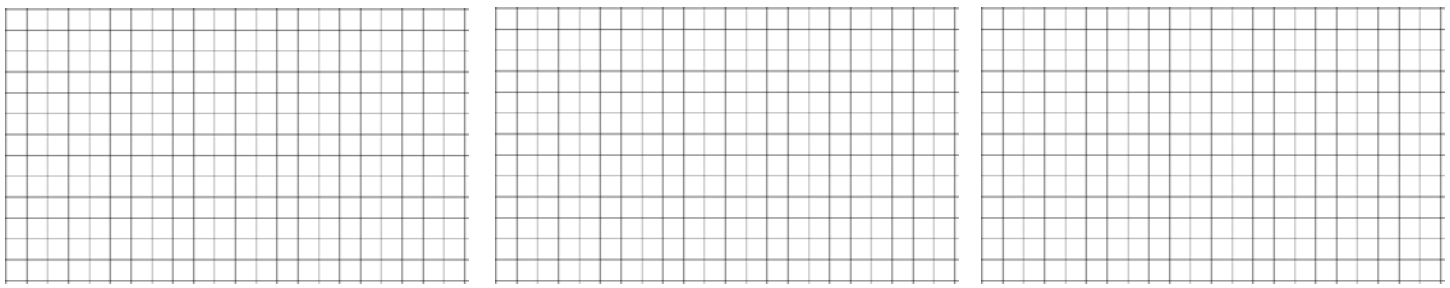
e) After 24 s, when will Trevor be at the lowest height again?

f) At what times is Trevor at the top of the wheel?

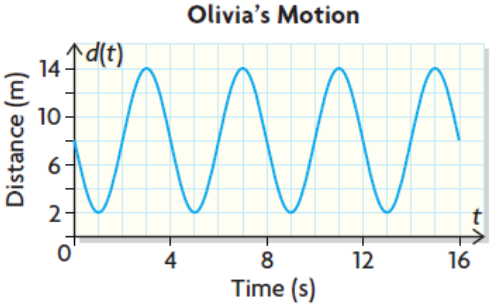
g) When will his height be 4 m between 24 s and 30 s?

3. Sketch the sinusoidal graphs that satisfy the properties in the table.

	Period	Amplitude	Equation of the Axis	Number of Cycles
a)	4	3	$y = 5$	2
b)	20	6	$y = 4$	3
c)	80	5	$y = -2$	2



4. Olivia was swinging back and forth in front of a motion detector when the detector was activated. Her distance from the detector in terms of time can be modelled by the graph shown.



a) What is the equation of the axis, and what does it represent in this situation?

b) What is the amplitude of this function?

c) What is the period of this function, and what does it represent in this situation?

d) How close did Olivia get to the motion detector?

e) At t = 7s, would it be safe to run between Olivia and the motion detector? Explain your reasoning.

f) If the motion detector was activated as soon as Olivia started to swing from at rest, how would the graph change? (You may draw a diagram or a sketch.) Would the resulting graph be sinusoidal? Why or why not?

5. $y = 2\sin\frac{1}{4}x$

a) What are the period and amplitude?

b) Where are its zeros?

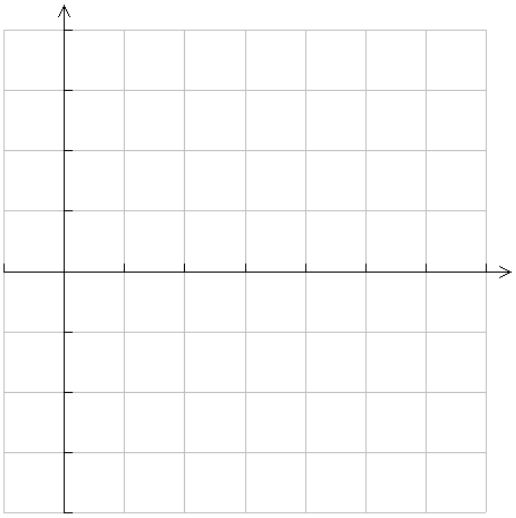
6. $y = 3\cos x$

a) What are the period and amplitude?

b) Where are its zeros?

7. On the same set of axes from 0 to 360°, graph: $y = 3\cos(2x)$ and $y = \sin(\frac{1}{2}x)$

How many points satisfy the equation $3\cos(2x) = \sin(\frac{1}{2}x)$?



6. Each sinusoidal function below has undergone one transformation that has affected either the period, amplitude, or equation of the axis. In each case, determine which characteristic has been changed and indicate its value.

a) y = sin x + 2

b) y = 4 sin x

d) y = sin(2x + 30°)