Name _____   Date _____

Modeling Periodic Phenomena with Trigonometric Functions - Guided Lesson

1) The following tabled values show the height above the ground of a point on a bicycle wheel as the bicycle is wheeled along a flat surface.

Distance travelled (cm)	0	25	50	75	100	125	150	175	200	225	250
Height above ground (cm)	0	4	8	12	16	20	17	13	9	5	1

Distance travelled (cm)	275	300	325	350	375	400	425	450	475	500
Height above ground (cm)	2	6	10	14	16	20	18	14	8	3

a) Plot the graph of height against distance.

b) Is the data periodic? If so, estimate:

i- The equation of the principal axis   ii- The maximum value
iii- The period   iv- The amplitude

2) For each set of data, draw a scatter plot and decide whether or not the data exhibits approximately periodic behavior

a.

x	0	1	2	3	4	5	6	7	8	9	10	11	12
y	0	1.5	1.8	1.5	0	-1	-1.8	-1	0	1.5	1.8	1.5	0

b.

x	0	1	2	3	4
y	8	4	0	4	8

c.

x	0	0.5	1.0	1.5	2.0	2.5	3.0	3.5
y	0	1.2	3.3	4.5	5.0	4.5	3.3	2.5

d.

x	0	2	3	4	5	6	7	8	9	10	11
y	0	3.7	2.2	1.1	2.5	6.7	8.7	9.5	9.1	7.7	10.1

3) The following tabled values show the height above the ground of a point on a bicycle wheel as the bicycle is wheeled along a flat surface.

Distance travelled (cm)	0	20	40	60	80	100	120	140	160	180	200
Height above ground (cm)	0	3	6	9	12	15	18	15	12	9	6

Distance travelled (cm)	220	240	260	280	300	320	340	360	380	400
Height above ground (cm)	3	6	9	12	15	18	15	12	9	6

a) Plot the graph of height against distance.

b) Is the data periodic? If so, estimate:

i- The equation of the principal axis   ii- The maximum value
iii- The period   iv- The amplitude