MA40S APPLIED
PERIODIC DATA
END UNIT TEST

Name: _____
Date: _____

Use the graphing calculator to its full effect if you want.
Formulas at back
Use the course reference notes

**/4** 1. Name two things that are periodic and state their approximate period.

2. Convert the following angular measurements by completing the white spaces (round to 2 decimal places if necessary)

**/7**

| Angle[°] | π Radians | Decimal Radians |
|---|---|---|
| 30° | π/6 | 0 |
| 45° | | |
| 90° | | 1.57 |
| | $\frac{2\pi}{3}$ | |
| –240° | | |
| 270° | | |

3. The Great Canadian Bungee Company offers jumps from a **200** foot bridge. A jumper's height above the water for the first 10 seconds is *modeled* by the formula:

**y=98*Sin(0.6*t + 1.5) + 102**

where ***y*** is the height in feet above the water and ***t*** is the time in seconds from time of jumping.

**/2** a. Determine the Period

**/1** b. Describe in words what the period physically means in this function.

/2 c. State the **Amplitude**

d. What is the jumper's average (**median**) height above the water?

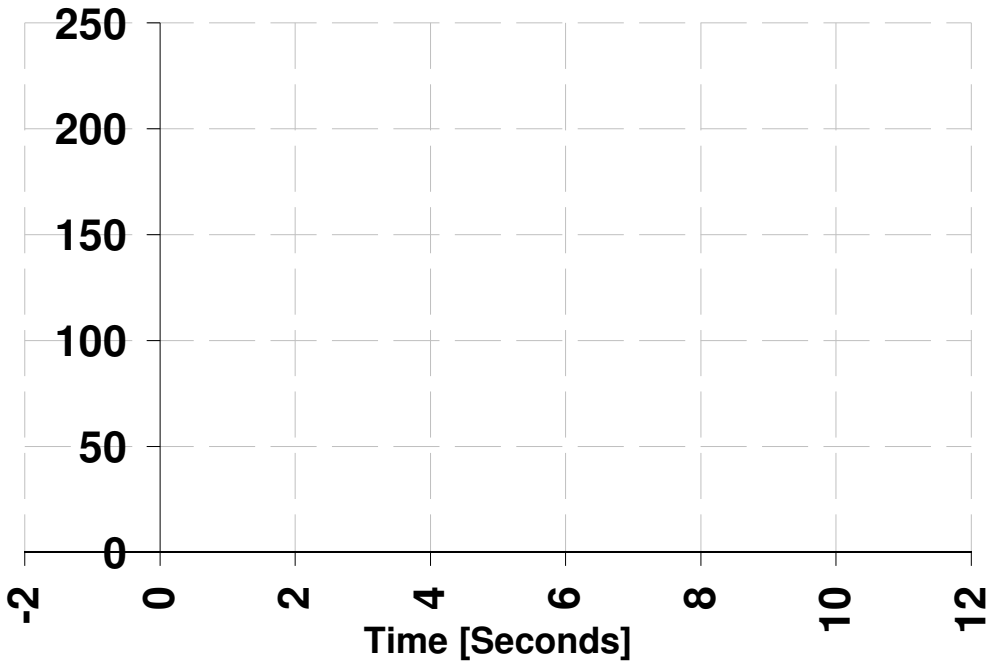
/1

e. How high is the jumper at **t = 3** seconds?

/2

/2 f. What duration of time does the jumper spend above 50 feet ***above*** the water in each cycle?

/10 g. **Accurately** sketch the function below for one complete cycle. At least five significant points should be shown.




/1 h. Does this equation and graph represent an exact physical model of a jumper during a jump? Explain why or why not.

**4.** Find the regression equation that best fits this data (round all A, B, C, D values to nearest 2 decimals)**:**

| **x** | **0** | **2** | **4** | **6** | **7** | **10** | |
|---|---|---|---|---|---|---|---|
| **y** | **2.000** | **-0.877** | **0.368** | **3.951** | **-0.927** | **1.603** | |

a. Equation:

b. Sketch the graph below:

**BONUS QUESTION** (Max 4 Marks if you need them)

Given the function **y=45 sin(3x – 2) + 4**

a. What is the amplitude?

b. What is the period?

c. What is the vertical shift?

d. What is the MAXIMUM?

FORMULAS

**PERIODIC DATA**

y=Asin (Bx+C) + D A is the amplitude, half the Max - Min. B is the number times a cycle fits into 2π. Big B squishes the cycles. C is phase shift horizontal. Affects where a cycle starts (phase shift). D is Median (vertical shift).
Drawing a sinusoidal figure.

1// Plot the D with dashed line. 2// Find the period by measuring or looking at data. Use Period = $\frac{2\pi}{B}$.

Period is same as wavelength. One is time, the other is distance. It is the length it takes a cycle to repeat.

3// Plot start point on median (use start point = **-**C/B). 4// Plot end point on median (one period to right) 5// Plot Mid point on Median. 6// Plot 1st Quarter point (Maximum) 7// Plot 3rd quarter point. 8//Connect/

8//.Check: if C is positive then sine curve shifts to the left! If B is big, then the normal sine curved is scrunched up.

Start Point = $\frac{-C}{B}$ (phase shift)

Period = $\frac{2\pi}{B} = \frac{6.2832}{B}$

Radians = degrees * $\frac{\pi}{180^{\circ}}$

Max = D+A

Min = D–A