**TASK 1: (COMPLETED UNDER EXAM CONDITIONS)**

**Knowledge & Procedures**

**Question 1.**

You will be given a table of data. During the lesson you must:

* Draw a graph using an appropriate scale;
* Determine the amplitude and period;
* Determine an equation using your hand-drawn graphical data;
* Use the sine regression capability of your calculator to find an equation for the data.

**Modelling & Problem Solving**

**Question 2.**

* Use the graph and your equations to find values that fit a particular condition (e.g. maximum height, times when the value is above a given value, etc.)
* Comment on strengths, limitations & assumptions in using your model.

**TASK 2 (TWO WEEKS)**

## Knowledge and Procedures

**Question 3.**

You are to collect some data of your own which is periodic.

* + You are to generate the data in pairs. You will be utilising LoggerPro so suggested data is a pendulum swinging, a spring bouncing, room temperatures, sound waves, or another as approved by teacher. You will have **one lesson** to generate the data and produce a graph. Ensure you save the data and graph for insertion into your assignment. If more time is required, you will need to organise it outside of class-time.
  + Describe your method of data collection and what modifications were necessary to ensure reliable data was collected. Draw a diagram of your setup.
  + [](http://images.google.com.au/imgres?imgurl=http://www.wwu.edu/depts/tutorialcenter/calculator.gif&imgrefurl=http://www.wwu.edu/depts/tutorialcenter/calculators.htm&h=392&w=404&sz=78&hl=en&start=3&um=1&tbnid=49pVLOf2y3ibeM:&tbnh=120&tbnw=124&prev=/images%3Fq%3Dcalculator%26um%3D1%26hl%3Den)Display the data in a table with appropriate headings. You must include enough points to include at least 2 periods.

**Question 4.**

a. Use LoggerPro to graph the data, including labels.

* + - Find the period and amplitude.
    - Use the ‘Curve Fit’ capability of LoggerPro to find an equation for the data.
    - Save the graph for insertion into your assignment.

b. Use the sine regression capability of your calculator to also find an equation for the data.

##### Modelling and Problem Solving

**Question 5.**

a. Compare the equations that model your data (LoggerPro & calculator versions) in Question (2). **Analyse the data that can be generated** from each model and comment on the **strength of the model** for interpolated values.

b. Use both equations from Question (2) to predict a value of the dependent variable, using a value for the independent variable, which is outside of the range of the data you found **(i.e. you will need to extrapolate).** Explain clearly what you are trying to predict.

c. Comment on any **limitations** in the model you have used and on the reliability of your prediction.

d. **Identify any assumptions** made and discuss their effect on the predictions you made.