Useful suggestions for harmonic motion problems:

- When reading the problem, almost always a maximum and minimum value will be revealed. Plot these on your vertical axis and use them to determine the vertical shift and amplitude of your function. Since maximum and minimum values are normally provided it is usually easier (but not necessary) to write a cosine function instead of a sine function.

- Label the horizontal axis with the times associated with the max and min values and plot these points on your graph. Connect the points you plotted to form a sinusoid wave. Use the values along the horizontal axis to determine the phase shift and period of the function.

When asked questions about a particular problem, it is often useful to use your calculator and examine the graph of the function.

- Your calculator MUST be in radian mode. Use the "x" key as the variable when you type your equation into your calculator even though you may have written "t" in your equation.

- You MUST have parenthesis in the proper places in your equation. Many times, the "b" value is a fraction and therefore must be enclosed in parenthesis. In addition, everything coming behind the trig function up to the vertical shift number must also be enclosed in parenthesis. Here is a model of what your equation should look like:

$$y = a\cos\big((b)(x-c)\big)+d \qquad \text{or} \qquad y = a\sin\big((b)(x-c)\big)+d$$

- You must set your window for each problem:
  1. The y max and y min values will be determined using the max and minimum values in the function. Always have your window adjusted to go some above the max value and some below the max value. Decide on a reasonable y scale for your graph.
  2. Use the phase shift and period to help you set up the x min and x max on your graph. Again, have your window adjusted to go a little beyond the boundaries of one cycle of your graph. Adjust your x scale to a reasonable number.

- When asked to find "y" value for a particular "x" , the easiest thing to use is the "2nd Calc/value" option on your calculator. Remember that when you use this option, your window must be large enough to include your requested x value.

- When asked to find an "x" value for a particular "y", you must graph a second equation (y = given constant value) and then find the intersection of the graph of that horizontal line with your sinusoid curve (use 2nd Calc/intersect). It is often helpful to reset your window adjusting the x min to be the specified time after which you are trying to find an answer.