

DPGRAPH Assignment #2 - Math 260 – Towers

We have seen that DPGRAPH makes useful 3D plots, but it also can be used for making 2D plots. In this exercise, you will get some practice with 2D plots.

1. Open the file m260_problem2.dpg, which is available at my website <http://www.miracosta.edu/home/jtowers/>. You should see the graph of a parabola, along with a tangent line.
2. From the menu, select scrollbar, then select the parameter A. Go back to the plot, and move the scrollbar up and down. Note how the graph changes. Select edit from the menu, and find where the parameter A appears.
3. Repeat step 2, except using the parameter B.
4. Repeat step 3, except using the parameter C.
5. Repeat step 4, except using the parameter D. What is plotted is the parabola $y = f(x) = Ax^2 + Bx + C$, along with a tangent line. What about the tangent line? Remember that the tangent line to a graph like this is $y = f(x_0) + f'(x_0)(x - x_0)$. Of course, for our parabola, $f'(x_0) = 2Ax_0 + B$. I used the parameter D for x_0 , so the code for the tangent line looks like $y = AD^2 + BD + C + (2AD + B)(x - D)$.
6. Replace the graph of the parabola with the graph of the sinusoid $y = f(x) = A\sin(Bx + C)$. Find the equation of the tangent line to this graph at the point $(x_0, f(x_0)) = (D, f(D))$. Replace the graph of the tangent line to the parabola with the graph of the tangent line to the sinusoid.
7. Your graph should show the sinusoid, along with a tangent line. Use the scrollbar to make sure that when you vary each of the parameters A, B, C, D the graphs change in the way you would expect.
8. Turn in six plots that show your plots with a variety of choices of the parameters A, B, C, D.

Notes:

1. What you see when you originally open the dpgraph file m260_problem2.dpg should look something like this:



