

DPGRAPH Assignment #5 - Math 260 – Towers

The purpose of this exercise is to use DPGRAPH to plot parametric curves, along with their tangent lines, in 3D.

1. Open the file m260_problem5.dpg, which is available at my website <http://www.miracosta.edu/home/jtowers/>. You should see a 3-dimensional curve, along with its tangent line. The curve is given parametrically by
$$x = t$$
$$y = t^2 / 5$$
$$z = t^3 / 25$$
2. Take a look at the graph3d command that produced this. You will notice that dpgraph uses the variable U instead of the variable t that we are more accustomed to. Also notice that the parameter a is being used to identify the location where the tangent line passes through the curve. You can use the scroll bar to move the point of tangency, and you should verify this.
3. Make a plot of the following parametric curve (which is a helix):
$$x = t$$
$$y = 3 \sin(2t)$$
$$z = 3 \cos(2t)$$
4. In your plot, make the bounding box large enough so that at least three complete turns of the helix are visible. Also plot the tangent line, using the parameter a to control the point of tangency, as I did in the example.
5. Print out three plots with different values of the parameter a , i.e., three different points of tangency. These plots are what you will turn in to me.

Notes:

1. What you see when you originally open the dpgraph file m260_problem5.dpg should look something like this:



