

DPGRAPH Assignment #6 - Math 260 – Towers

The purpose of this exercise is to use DPGRAPH to plot parametric curves, along with their velocity and acceleration vectors, in 3D.

1. Open the file m260_problem6.dpg, which is available at my website <http://www.miracosta.edu/home/jtowers/>. You should see a 3-dimensional curve, along with its velocity and acceleration vectors. 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. The parameter u plots the curve, and the parameter v plots the velocity and acceleration vectors. Notice that v ranges between 0 and 1. This gives the correct length for the vectors. The parameter a is used to move along the curve, and can be controlled with the scroll bar – 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. You can use the same bounding box that I did for the example above. Also plot the velocity and acceleration vectors, using the parameter a to vary the point on the curve, as I did in the example.
5. Print out three plots with different values of the parameter a , and showing the curve from different orientations. These plots are what you will turn in to me.

Notes:

1. What you see when you originally open the dpgraph file m260_problem6.dpg should look something like this:

