

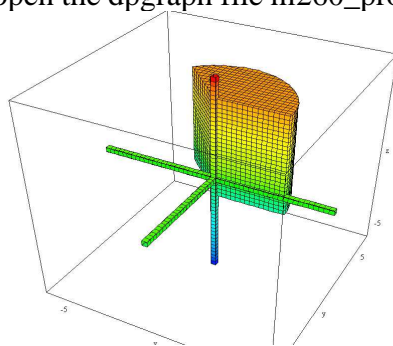
DPGRAPH Assignment #4 - Math 260 – Towers

The purpose of this exercise is to use DPGRAPH to plot regions described by inequalities, using cylindrical or spherical coordinates.

1. Open the file m260_problem4.dpg, which is available at my website <http://www.miracosta.edu/home/jtowers/>. You should see a sort of wedged-shaped object, along with three very slim cylinders, which are intended to represent the coordinate axes. The wedge-shaped object is a plot of the following inequalities, which are in cylindrical coordinates.
 $-1 < z < 4,$
 $r < 3,$
 $0 < \theta < 3\pi / 4.$
2. Take a look at the graph3d command that produced this. First, in order for dpgraph to understand these inequalities, each one is split into two inequalities, separated by an ampersand - &, which is dpgraph's **logical and** operator. Thus, you see a total of 5 inequalities, and they are separated by &'s. Next, dpgraph understands cylindrical coordinates in its parametric mode (which we are not using for this exercise), but not in its usual implicit mode (that's what we are using for this exercise). So, each of r and θ must be converted to Cartesian coordinates. Finally, we use the dpgraph command angle(x,y) instead of atan(y/x) to compute θ .
3. Make a plot of the following inequalities, which are in spherical coordinates
 $\rho < 5,$
 $0 < \phi < \pi / 4,$
 $-\pi < \theta < \pi.$

Notes:

1. What you see when you originally open the dpgraph file m260_problem4.dpg



should look something like this:

