

Example Technology Exercise 11

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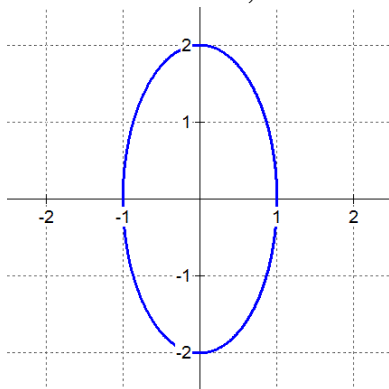
Cylinder

A cylinder is formed when one of the three variables is missing. That third dimension can assume any value, so a cylinder is a plane curve extended into space.

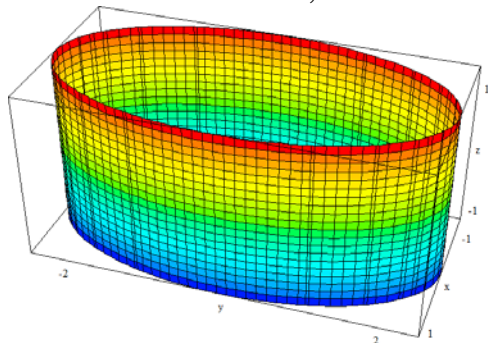
The cylinder is not one of the six basic quadric surfaces, so it's hard to complete the assignment for this one. This is really just here to show you an example of what you should be doing.

An example of a cylinder would be $4x^2 + y^2 = 4$

In 2 dimensions, that would be an ellipse.



But in 3 dimensions, it becomes a cylinder.



This particular graph doesn't look good in polar or spherical coordinates, but it can be parametrized. The basic ellipse is $x = 2 \cos t$, $y = \sin t$ and then the z is completely independent, so it gets another parameter. Normally, and this is the way dpgmath works, we use u and v for the parameters. So the graph above could be written as $x = 2 \cos u$, $y = \sin u$, $z = v$ where $0 \leq u \leq 2\pi$, $-1 \leq v \leq 1$. However, there really is no restriction on the v for a cylinder (just the graph above). Parametric surfaces are covered in chapter 15, this is just a sneak preview.