# Mathematics 554 Homework.

In this homework we will try to get a feel for plotting surfaces in $\mathbb{R}^3$. Rather than drawing by hand we will use the software Desmos:

`https://www.desmos.com/`

and in particular its 3D graphing package:

`https://www.desmos.com/3d`

What you will do is have Desmos plot a couple of surfaces, take a screen shot of the result and email it to me along with the area of the surface (also computed by Desmos).

**Problem** 1. (a) We first plot a graph $y = f(x, y)$. I have a file you can edit at:

`https://www.desmos.com/3d/88xazp22i4`

Change the function to

$$f(x, y) = x(x^2 - 1)y$$

and plot this over the rectangle $-2 < x < 2$ and $-3 < y < 3$. Use the mouse to make a random rotation of this plot (this is so that no two of you will have exactly the same graph) take a screen shot of this. Also compute the area of this graph.

(b) We now compute plot a surface of revolution. Go to

`https://www.desmos.com/3d/slul0fal0o`

and plot the surface of revolution with profile

$$x = f(z) = 1 - \cos(2z)$$

for $-pi < z < \pi$. Again take a random rotation and take a screen shot Then use Desmos to compute the area.

(c) Send me a single email (`howard@math.sc.edu`) containing both screen shots and both areas.