Written HW7 – MATH 2501 Fall 2020

**Due by 23 September for timely completion credit**

For these problems, you should attach your plots to your submitted work. The work of finding a tangent line must be entirely done symbolically for full credit.

1. A "nephroid" can be the graph of solutions to the equation

$$\left(x^2+y^2-4\right)^3 = 108y^2.$$

   Use Desmos to draw this curve, plot the point $\left(-\sqrt{3\left(1+2^{\frac{2}{3}}\right)}, 1\right)$ on the curve, and then find the equation and plot the tangent line to the curve at that point.

2. The "bean curve" is the set of solutions to the equation

$$x^4+x^2y^2+y^4 = x\left(x^2+y^2\right).$$

   Use Desmos to draw this curve, plot the point $\left(\frac{1}{2}, \frac{1}{2}\sqrt{\frac{1}{2}+\frac{\sqrt{5}}{2}}\right)$ on the curve, and then find the equation and plot the tangent line to the curve at that point.