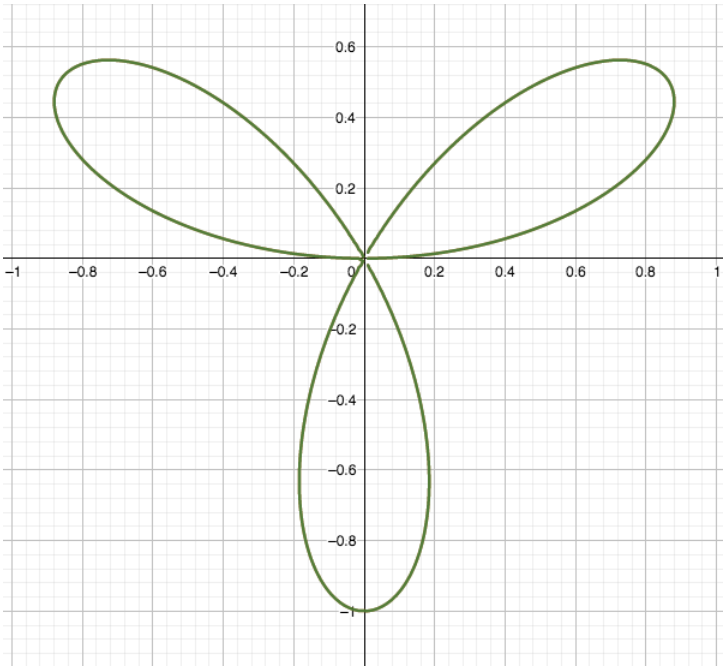
1. Chapter 3 Section 7:Implicit Functions

Example 1.1. *https://www.desmos.com/calculator/7frnskk2u2*

$(x^2 + y^2)^2 = 3x^2y - y^3$



Draw the line tangent to the graph at $(0, -1)$ *and at* $(-1/2, 1/2)$.

Fact: The slope of the line tangent to the graph in the xy-plane at the point (a, b) will still be the instantaneous rate of change of y with respect to x. That is the slope of the tangent is $\dfrac{dy}{dx}$.

Example 1.2. *Find* $\frac{dy}{dx}$ *given* $(x^2 + y^2)^2 = 3x^2y - y^3$

Example 1.3. *Find the equation of the line tangent to the graph of* $(x^2+y^2)^2 = 3x^2y - y^3$ *at the following points using the derivative.*

(a) $(0,-1)$ *and*

(b) $(-1/2, 1/2)$.

Example 1.4. *Find* $\dfrac{dy}{dx}$*:* $\cos(2x+y) = xy$

Example 1.5. *Find the equation of the line tangent to the graph of* $\cos(2x+y) = xy$ *at the point* $(\pi/4, 0)$.