

Math 241: HW 9

Due on Monday, September 30

Fall '13

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Note: I would recommend graphing each of these to "check" your answers. I would also recommend playing around with graphing implicit functions online.

Problem 1

(EXTRA CREDIT) Consider the implicit function, $y^3 + y^2 + xy = x^2y^2$. Show that the point $(0,0)$ is indeed on the graph, and then show that the derivative is undefined at $(0,0)$. If you graph this function it LOOKS like there is a unique tangent line at $(0,0)$, however, if compute y' , it is clearly NOT defined at $(0,0)$. Can you find a point on the graph such that the derivative IS defined? Hint: (cleverly) pick a value for y , then solve for x . There may be more than one possible x -value, just pick one. Then give the equation of the tangent line at this point.

Problem 2

Suppose that $\sin(xy) = \frac{\sqrt{2}}{2}$, find $\frac{dy}{dx}$ at the point $(\pi, \frac{1}{4})$.