

Math 1, Fall 2003
Goals for Week 11: December 1-3, 2003

Defining Implicit Functions: Given some relation of the form $f(x, y) = g(x, y)$ and the curve defined by it, you should understand what the concept of an implicit function for that relation in terms of both the graph and algebraically. For a sufficiently simple relation, you should be able to find the formulae for the implicit functions of that relation. You should know what the implicit function of a relation at a point is and how to find it. You should know what it means for a point on the curve of a relation to be a bad point.

The Conic Sections: You should know what a conic section is, both algebraically and graphically. You should know the three types of shapes which conic sections can take. In particular, you should know the general form of a circle and some ellipses (see the notes). You should be able to explicitly determine the formulae for the implicit functions of conic sections.

Implicit Differentiation: Given the formula for a relation, you should be able to determine the derivatives of the implicit functions of that relation using the process of implicit differentiation. You should be able to find the slope of the tangent line to the curve of the relation at all points on that curve except the bad points. You should know what a bad point is in the context of implicit differentiation, and given sufficiently simple relation, you should know how to find those bad points.

Defining Inverse Functions: You should know what an inverse function is. You should be able to find the inverse functions of exponential and power functions. You should understand that not all functions have inverses, and you should be able to give examples of functions which do not have inverses.

Graphs of Inverse Functions and the Horizontal Line Test: You should know the relationship between the graph of a function and the graph of its inverse. Given the graph of a function, you should be able to graph its inverse, if it exists. You should know the horizontal line test, the purpose for which we use it, and how it is related to the vertical line test.

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Lecture Notes for Week 11: Lecture 24 and Lecture 25

Homework for Week 11: Homework 20