Calculus Section 2.5 Implicit Differentiation

Homework: page 145 #’s 1-7 odd, 13, 15, 29, 31, 45, 46

-Distinguish between functions written in implicit form and explicit form.  
-Use implicit differentiation to find the derivative of a function.

An **implicit** function is a function written where y is not isolated. Some implicit functions can be re-written in explicit form ( becomes ) while others cannot (2y2 + 3xy = 3).

Functions that cannot be written explicitly must apply **implicit differentiation** to find the derivative.

When differentiating with respect to x, any term with only x variables will be differentiated normally. Any term with a y (or another variable) must be differentiated using the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because it is assumed that y is defined implicitly as a differentiable function of x.

1)  2)  3)

3)  4) 

**Steps to Implicit Differentiation**1. Differentiate both sides of the equation with respect to x.  
2. Collect all terms involving dy/dx on the left side of the equation and move all other terms to the right side.  
3. Factor dy/dx out of the left side of the equation.  
4. Solve for dy/dx.

**Find the equation for the slope of each line.**  
1)  2) 

Determine the slope of the graph: 3(x2 + y2)2 = 100xy at the point (3,1).

Find the 2nd derivative of the function 4xy = 10.