MAC 2311	Learning Activity $\#8$	Implicit Differentiation Logarithmic Differentiation
Name:		Group #:
1. For the following implicity defined curves, find $\frac{dy}{dx}$.		
(a) $x^3 + y^3 = 1$	x + xy	

(b) $e^{x+y} = 5xy$

(c)
$$\sin\left(\frac{y}{x}\right) = 3x^3 - 2y^2$$

2. Consider the curve defined by the equation $y + \sin y = x + \pi$. Find the equation of the tangent line to the curve at the point $(\pi, 2\pi)$.

3. For the following implicitly defined curves, find $\frac{d^2y}{dx^2}$.

(a)
$$x^2 + y^2 = 1$$

(b)
$$y - \cos y = x + \frac{\pi}{3}$$

- 4. Find the derivatives of the following. Simplify only by canceling common factors and combining like terms as appropriate.
 - (a) $y = x^{\ln x}$

(b)
$$y = (\sin x)^{\cos x}$$

(c)
$$y = \left(\frac{x-1}{x^2+1}\right)^{x^2}$$