

**MAT 1214: CALCULUS I  
IMPLICIT DIFFERENTIATION**

(1) Find the following derivatives using implicit differentiation:

(1)  $xy + x + y = x^2y^2$   $y' = \underline{\hspace{2cm}}$ .

(2)  $\cos xy + x^7 = y^7$   $y' = \underline{\hspace{2cm}}$ .

(2) At the point  $P(0, 1)$  of the curve  $y^5 + x^3 = y^2 + 9x$ , find (a) the slope and equation of the tangent line, and (b) the slope and equation of the normal line.

(a) Slope of tangent =  $\underline{\hspace{2cm}}$ .

Equation of tangent:  $\underline{\hspace{2cm}}$ .

(b) Slope of normal =  $\underline{\hspace{2cm}}$ .

Equation of normal:  $\underline{\hspace{2cm}}$ .