Calculus I Section 2.5 Homework

1) Equation (implicit function) : $5x^2 + y^2 = 12$

a) $D_x(5x^2) = ?$

b) $D_x(y^2) = ?$

c) $D_x(12) = ?$

d)Implicit Differentiation Equation: ?

e) $y' = \frac{dy}{dx} = ?$

2) Equation (implicit function) : $\sqrt{x} + \sqrt{y} = 8$

a) $D_x(x^{1/2}) = ?$

b) $D_x(y^{1/2}) = ?$

c) $D_x(8) = ?$

d) Implicit Differentiation Equation: ?

e) $y' = \frac{dy}{dx} = ?$

3) Equation (implicit function) : $2x^3 - xy + y^2 = 12$

a) $D_x(2x^3) = ?$

b) $D_x(-xy) = ?$ Hint: Use Product Rule

c) $D_x(y^2) = ?$

d) $D_x(12) = ?$

e)Implicit Differentiation Equation: ?

f) $y' = \frac{dy}{dx} = ?$

4) Equation (implicit function) : $4x^3 - 3x^2 \cdot y + 2x \cdot y^2 = 10$

a) $D_x(4x^3) = ?$

b) $D_x(-3x^2 \cdot y) = ?$ Hint: Use Product Rule

c) $D_x(2x \cdot y^2) = ?$ Hint: Use Product Rule

d) $D_x(10) = ?$

e)Implicit Differentiation Equation: ?

f) $y' = \frac{dy}{dx} = ?$

5) Equation: Equation (implicit function) : $xy = 14$

a) $D_x(x \cdot y) = ?$ Hint: Use Product Rule

b) $D_x(14) = ?$

c)Implicit Differentiation Equation: ?

d) $y' = \frac{dy}{dx} = ?$

e) $y'(1,\ 14) = ?$

6) Equation (implicit function) : $(x + y)^3 + x^3 + y^3 = 2$

a) $D_x((x + y)^3) = ?$

b) $D_x(x^3) = ?$

c) $D_x(y^3) = ?$

d)Implicit Differentiation Equation: ?

e) $y' = \frac{dy}{dx} = ?$

f) $y'(0,1) = ?$

7) Find equation of tangent line at (1, 4).

Equation: Equation (implicit function) : $x \cdot y = 4$

a) $D_x(x \cdot y) = ?$

b) $D_x(4) = ?$

c) Implicit Differentiation Equation: ?

d) $y' = \frac{dy}{dx} = ?$

e) Slope of tangent line = $y'(1,4) = ?$

f) Equation of Tangent Line:_____

Hint: $y - y_1 = m(x - x_1)$

8) Find equation of tangent line at (0, 4).

Equation (implicit function) : $(3x^2 + 2) \cdot y = 8$

a) $D_x((x^2 + 4) \cdot y) = ?$ Hint: Use Product Rule

b) $D_x(8) = ?$

c) Implicit Differentiation Equation: ?

d) $y' = \frac{dy}{dx} = ?$

e) Slope of tangent line = $y'(0,4) = ?$

f) Equation of Tangent Line:_____

Hint: $y - y_1 = m(x - x_1)$

9) Find equation of tangent line at (0, 0).

Equation (implicit function) : $(x^2 + y^2)^2 + 6x^2 y = 0$

a) $D_x((x^2 + y^2)^2) = ?$ Hint: Use Power Rule

b) $D_x(6x^2 y) = ?$ Hint: Use Product Rule

c) Implicit Differentiation Equation: ?

d) $y' = \frac{dy}{dx} = ?$

e) Slope of tangent line = $y'(0,0) = ?$

f) Equation of Tangent Line:_____

Hint: $y - y_1 = m(x - x_1)$