3.2 Implicit Differentiation

Calculus Name: _____ **CA #1**

Find $\frac{dy}{dx}$.

1. $(2y^4 + 1)^2 = 5x^2$

2. $\cos(2x + y) = 5x$

3. $2x - e^{4y^4} = y^2$

4. $-4y + 3y^2 + 7 = 4x^2$

5. $\ln(2xy^2) = 4x$

6. $4x^2 - 2x^4y^4 = 5$

Find the equation of the tangent line at the given point.

7. $x^2 - y^2 = 27$ at $(6, -3)$

8. $(x - y)^2 - 4x = 20y$ at $(4, 2)$

Find the equations of all horizontal and vertical tangent lines. Calculator allowed. Round to three decimals.

9. $x^2 + 10x = -7y^5 + 10$

Horizontal: _____

Vertical:_____

10. $12x - 3x^2 = y^2 - 4y$

Horizontal: _____

Vertical:_____

Answers to 3.2 CA #1

1. $\frac{5x}{16y^7+8y^3}$	2. $-\frac{5}{\sin(2x+y)} - 2$	3. $\frac{1}{y+8y^3e^{4y^4}}$	4. $\frac{4x}{-2+3y}$
5. $2y - \frac{y}{2x}$	6. $\frac{1-x^2y^4}{x^3y^3}$	7. $y + 3 = -2(x - 6)$	8. $y = 2$
9. Horizontal: $y = \sqrt[5]{5}$ Vertical: $x = -10.916$ and $x = 0.916$		10. Horizontal: $y = -2$ and $y = 6$. Vertical: $x = -0.309$ and $x = 4.309$	