Calculus I	**Name:** _____
Study Guide 11	**Class:** _____
Due Date: _____	**Score:** _____

No Work $\Leftrightarrow$ No Points

Use Pencil Only $\Leftrightarrow$ Be Neat & Organized

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1. Find $\dfrac{dy}{dx}$ by implicit differentiation:

   (a) (3 points) $x^2 - y^2 = 100$

   (a) _____

   (b) (3 points) $\dfrac{1}{x} + \dfrac{1}{y} = 1$

   (b) _____

   (c) (3 points) $x = \cos y$

   (c) _____

(d) (3 points) $x \cos y = y$

(d) _____

(e) (3 points) $x^3y^2 - 4 = 0$

(e) _____

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2. (5 points) Find the equation of the tangent line to the graph of $x^2y - 5xy^2 + 6 = 0$ at $(3, 1)$.

2. _____

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3. (5 points) Find the equation of the normal line to the graph of $\sin(xy) = y$ at the point $(\pi/2, 1)$.

3. _____

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4. (4 points) Find the equation of the tangent line to the graph of $\cos(xy) = y$ at the point $(0, 1)$.

4. _____

5. Find $\dfrac{dy}{dx}$ for

(a) (3 points) $y = \sqrt{x^2 - 4x + 8}$

(a) _____

(b) (3 points) $y = \dfrac{1}{2\pi}\sec^2(\pi x)$

(b) _____

(c) (3 points) $y = \csc\sqrt[3]{x^2}$

(c) _____

(d) (3 points) $y = \left(\dfrac{x-1}{x+2}\right)^{3/2}$

(d) _____

6. (5 points) At what point(s) is the tangent to the curve $y^2 = 2x^3$ perpendicular to the line $4x - 3y + 1 = 0$.

6. _____

7. (4 points) Find the equation of the normal line to the graph of $x^2 + y^2 = 100$ at $x = -6$ in the 3rd quadrant.

7. _____