

Math 265, Section E2 - Quiz 7

3 March 2006

Name: _____

DIRECTIONS: Answer the following questions or execute the following commands below. You may NOT use a calculator. Remember, you are an attorney and I am a jury of 12 people. You must convince me beyond a reasonable doubt that your answers are correct by showing work and *writing neatly*. Should you have any questions, do not hesitate to ask them. There are questions on the back!

1. Suppose

$$x^2 \cos y - y^2 \sin x = 0$$

where y is a function of x . Find dy/dx using *the Chain Rule*; i.e., not implicit differentiation.

2. Find the equation of the tangent plane to the surface $x^2 + y^2 + 2z^2 = 23$ at $(1, 2, 3)$.

3. Find $\partial w / \partial t$ if

$$w = e^{x^2+y^2}; \quad x = s \sin t, \quad y = t \sin s$$

by using the Chain Rule.

4. In the following statement, select which word is most appropriate for the term with which you fill in the blank: The gradient vector of f at P is always $\left\{ \begin{array}{l} \text{perpendicular} \\ \text{parallel} \end{array} \right.$ to the _____ of f through P .

5. In which direction is f decreasing most rapidly at a point P ?

6. **Bonus, 2 points.** What do “i.e.” and “e.g.” stand for *in Latin*?