

Math 265, Section E2 - Quiz 8

24 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. What are the dimensions of the rectangular box, open at the top, that has maximum volume when the surface area is 48?

2. Consider these two entities:

$$f(x, y, z) = 6x^2 + 12y^2 + 4z^2 \quad \text{and} \quad 40 = 6x^2 + 12y^2 + 4z^2$$

One of them you can sketch, the other you can't. Say which one you could sketch, and which one you couldn't. Explain why one is able to be sketched, and why the other is not.

3. In the statement of Lagrange's Method, the equation $g(\mathbf{p}) = 0$ is called the _____.

4. To maximize $f(x, y)$ is a(n) _____ extremum problem.

5. **Bonus (optional, worth 2 points):** With which famous woman in the annals of American history does accomplished mathematician Joseph Louis Lagrange share his birthday? On which day of the year does her birthday fall?