RECO 250 Homework Set #7 due Thursday Nov 12 Prof Kilkenny

Multivariate calculus: partial derivative, higher order partial derivatives, implicit differentiation, and the inverse function rule.

1. Do Problem 5.1.b) page 93, Dowling text. *Please repeat the problem, and box your answers.*

2. Do Problem 5.7.a) page 96, Dowling text. *Please repeat the problem, and box your answers.*

3. Study page 85 in our Dowling text. Then, restate what "Young's Theorem" says in your own words in one grammatically correct sentence.

4. Given the function in 5.1.**b)** Find also: $\frac{\partial^2 z}{\partial x^2}, \frac{\partial^2 z}{\partial y^2}, \frac{\partial^2 z}{\partial x \partial y}, \frac{\partial^2 z}{\partial y \partial x}$.

5. Problem 5.1.c) page 93, Dowling text. *Please repeat the problem, and box your answers.*

6. Given the function in 5.1.**c)** Find also: $\frac{\partial^2 z}{\partial w^2}, \frac{\partial^2 z}{\partial x^2}, \frac{\partial^2 z}{\partial y^2}, \frac{\partial^2 z}{\partial w \partial x}, \frac{\partial^2 z}{\partial w \partial y}, \frac{\partial^2 z}{\partial x \partial y}, \frac{\partial^2 z}{\partial y \partial x}$.

7. $k = g(x,y,z) = 3x^2y + 2xy^2z + 3z^2$ *Please repeat the problem, and box your answers.*
Find:

$\frac{\partial g}{\partial x}, \frac{\partial g}{\partial y}, \frac{\partial g}{\partial z}$

$\frac{\partial^2 g}{\partial x^2}, \frac{\partial^2 g}{\partial y^2}, \frac{\partial^2 g}{\partial z^2}$

$\frac{\partial^2 g}{\partial x \partial y}, \frac{\partial^2 g}{\partial y \partial z}, \frac{\partial^2 g}{\partial z \partial x}$

8. Problem 5.5.b) on page 95 in Dowling text. *Please repeat the problem, and box your answers.*

9. Problems 5.8.**a) and b)** on page 97 in the Dowling text.
Please repeat the problems, and box your answers.

10. Do problems 5.22.**a) and 5.22.c)** on pages 107 and 108 in the Dowling text.
Please repeat the problems, and box your answers.

11. Do problems 5.21. **a) and c)** in the Dowling text, page 107. **THEN**, using the Inverse function rule, also find $\frac{dx}{dy}$ for both problems. *Please repeat the problems, and box your answers.*