Math 131 Spring, 2008  Homework 13  Due March 4  Name: ____________________

Mathematics Quote: For a physicist mathematics is not just a tool by means of which phenomena can be calculated, it is the main source of concepts and principles by means of which new theories can be created. Dyson, Freeman

1. Reading materials:
   Textbook - Page 321-324
   (1) Examples 8.1, 8.2, 8.3
   (2) Lecture Notes on Related Rates.

2. Page 324: Turn in the ones with *.
   1, *2, 5, *6, 7, *8, 9, 10*, 13, 14*

3. Find $f'(x)$ where
   (1) $f(x) = \pi^x + x^\pi + \pi^x + x^\pi$
   (2) Extra points: (1) $f(x) = x^{\sin(x)}$ (2) $f(x) = (\sin(x))^x$

4. Find $\frac{dy}{dx}$ where $\cos(xy^2) + x^2 = \sin(y)$

5. Find $\frac{d^2y}{dx^2}$ if $\frac{dy}{dx} = \frac{3x^2y}{\sin(xy^2)}$