Homework for Week 8  
Feb. 18-2, 2008

The textbook exercises listed here should be completed before class begins; students will share solutions to these exercises at the beginning of class. You should be prepared to share a solution to any one of these.

Before Class on Tuesday, February 19, read Section 3.7 and work the following exercises:
Section 3.7, # 23, 25, 27, 33

Before Class on Thursday, February 21, read Section 3.8 (upto page 250) work the following exercises:
Section 3.8, # 5, 7, 15, 17

Before Class on Friday, February 22, finish reading Section 3.8 and work the following exercises:
Section 3.8, # 23, 25

Additional Practice Problems

Practice as many of these problems as you can. You may use your solutions as notes during the quiz on Tuesday, February 26.
Section 3.7, # 3, 7, 9, 15, 31, 35
Section 3.8, # 9, 11, 13, 19, 21
Written Homework

Your carefully written solutions to these questions are due at the beginning of class on Friday, February 22.

1. For each of the following, calculate $\frac{dy}{dx}$.
   (a) $x^2 + xy = e^y + 1$
   (b) $y = \tan^{-1} x$
   (c) $y = x^{\sqrt{x}}$
   (d) $y = (x + 1)^2(2x - 3)^8(5x + 2)^4(6 - x)^{10}$
   (e) $2(x \cos x)(\sin y) = 1$

2. (a) Find the linearization of the function $f(x) = x^{\frac{3}{4}}$ at the point where $x = 81$. (b) Use the answer for part (a) to estimate $(3.2)^{\frac{3}{4}}$.

3. The graph below shows the ellipse $\frac{x^2}{4} + \frac{y^2}{16} = 1$ and a line that is tangent to the parabola and that passes through the point $(6, 0)$. (a) Use calculus to find the coordinates of the point where the line touches the ellipse. (b) Find an equation for the line.

Hint: There are two unknowns here: the x- and y-coordinates of the point. You will need to identify two equations that allow you to solve for those two unknowns.