Math 126 C, D - Spring 2006
Mid-Term Exam Number One
April 20, 2006

Name: _____ Section: _____

1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
Total	60	

- Complete all questions.
- You may use a scientific, non-graphing calculator during this examination. Other electronic devices are not allowed, and should be turned off for the duration of the exam.
- If you use a trial-and-error or guess-and-check method, or read a numerical solution from a graph on your calculator, when an algebraic method is available, you will not receive full credit.
- You may use one hand-written 8.5 by 11 inch page of notes.
- Show all work for full credit.
- You have 50 minutes to complete the exam.

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1. Let $f(x) = 3 - 7x - 4x^2 + 6x^3$.

   (a) Find the 2nd-degree Taylor polynomial $T_2(x)$ for $f(x)$ based at $b = 1$.

   (b) Use the Quadratic Approximation Error Estimate to give an upper bound on the error $|f(x) - T_2(x)|$ on the interval $(0.75, 1.25)$.

2. Give the coefficient on x^{11} in the Taylor series for $f(x) = x^3 e^{x^2}$ based at $b = 0$.

3. Find a vector that is orthogonal to the vector $\langle 11, 3, -5 \rangle$ and has length 7.

4. Find the parametric equations for the line that is the intersection of the plane

$$x + y + 2z = 1$$

and the plane

$$3x - y + 4z = 1.$$

5. The set of points that are twice as far from the origin as they are from the point $(5, 5, 5)$ is a sphere. Find its center and radius.

6. Find the equation of the plane that passes through the point $(3, -1, 2)$ and contains the line

$$x = 5 - t, y = 3 + 3t, z = 8 + 2t.$$