Math 125 D and H - Spring 2004
Mid-Term Exam Number One
May 13, 2004

Name: _____ Section: _____

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

- Complete all questions.
- You may use a scientific calculator during this examination. Graphing calculators, and other calculating devices are not allowed.
- 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 80 minutes to complete the exam.

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1. Evaluate each of the following integrals.

(a) $$\int \frac{dx}{x^2 - 8x + 34}$$

(b) $$\int e^{-3x} \sin 4x \, dx$$

2. Evaluate each of the following integrals.

(a) $\int \tan^4 x \sec^4 x \, dx$

(b) $\int \frac{\cos x}{\sin^2 x + 1} \, dx$

3. Evaluate each of the following integrals.

(a) $\displaystyle\int \frac{x^3}{\sqrt{x^2-4}}\,dx$

(b) $\displaystyle\int \frac{x^3+5x^2+1}{x^2+2x}\,dx$

4. Evaluate each of the following integrals.

(a) $\displaystyle\int_1^\infty \frac{\ln x}{x^6}\,dx$

(b) $\displaystyle\int_0^\infty \frac{x}{(x^2+5)^2}\,dx$

5. Evaluate each of the following integrals.

(a) $\displaystyle\int \frac{1}{2x^2 - 32}\, dx$

(b) $\displaystyle\int \sin^3 x \cos^7 x\, dx$

6. Suppose Matt dug a conical hole in the ground. The top of the hole is a circle 10 feet in diameter, and the hole is 8 feet deep.

   Suppose dirt has a density of 60 lb/ft^3. Set up but DO NOT EVALUATE an integral representing the amount of work Matt did to lift the dirt to the top of the hole.