Math 125 H - Winter 2010
Mid-Term Exam Number One
January 29, 2010

Name: _____

Student ID number: _____ 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 electronic devices are not allowed and should be turned off for the duration of the exam.
- If you use trial-and-error, a guess-and-check method, or numerical approximation when an exact method is available, you will not receive full credit.
- You may use one double-sided, 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 the following integrals.

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

   (b) $\displaystyle\int x^9(x^5+1)^{12}\,dx$

2. Evaluate the following integrals.

(a) $\int_0^{\pi} (1+\sin x)\,(2+\cos x)\; dx$

(b) $\int_e^{e^2} \dfrac{(x+1)(x-1)}{x}\, dx$

3. Give upper and lower bounds for the integral

$$\int_0^1 e^{x^2}\,dx$$

which differ by less than $\frac{2}{3}$.

4. Let $c > 0$. The area bounded by $y = c - x^2$ and the x-axis equals 3. Find c.

5. Consider the region bounded by $y = x^2 - x$ and the x-axis. Find the volume of the solid of revolution created by revolving this region about the y-axis.

6. Consider the region bounded by $y = 5 - \frac{1}{4}x^2$ and $y = x^2$. Find the volume of the solid of revolution created by revolving this region about the x-axis.