Math 125 G - Winter 2009
Mid-Term Exam Number Two
February 26, 2009

Name: _____

Student ID number: _____   Section: _____

1	20	
2	10	
3	10	
4	10	
5	10	
6	10	
Total	70	

- 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) $\int \dfrac{x^2}{(2x+1)(x-1)}\, dx$

(b) $\int \dfrac{x^3}{\sqrt{1-x^2}}\, dx$

2. Evaluate the integral.

$$\int \sqrt{x} \sin \sqrt{x}\, dx$$

3. Evaluate the integral.

$$\int \frac{dx}{(x^2 - 4x + 12)^{5/2}}$$

4. Evaluate the integral.

$$\int_{-1}^{1} \frac{1}{e^x - 1} \, dx$$

5. Evaluate the integral.

$$\int_0^\infty e^{-x} \sin x \, dx$$

6. The region R in the first quadrant of the xy-plane is bounded by $y = 3$, $y = 4 - x$, the x-axis, and the $y - axis$. A tank is made in the shape of the solid of revolution created by rotating R about the y-axis.

Assume units in meters (so the tank is 3 meters high).

Suppose the tank is filled with water with a density of 1000 kg/m^3. Set up but DO NOT EVALUATE an integral representing the work required to pump all the water to the top of the tank.