Math 125 G - Winter 2011
Mid-Term Exam Number One
January 27, 2011

Name: _____

Student ID number: _____   Section: _____

1	15	
2	15	
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) $\int \left(x^4 + 5x^3 + 2\cos x - \frac{1}{x^2 + 1} \right) dx$

(b) $\int 13x(4x^2 + 5)^{17} \, dx$

(c) $\int (2x + 1)\sqrt{3x - 5} \, dx$

2. Evaluate each of the following integrals.

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

(b) $\displaystyle\int_{\frac{1}{2}}^{3} |x^2 - 1|\, dx$

(c) $\displaystyle\int (x+1)(x+2)\, dx$

3. Approximate the integral $\int_0^1 \sin(\pi x^2)\, dx$ using the Midpoint Rule, with $n = 2$.

4. Find the area of the region in the first quadrant bounded by $y = x^2$, $y = 6 - x$ and the x-axis.

5. Let R be the region in the first quadrant bounded by $y = x(b - x)$ and the x-axis. Let S be the solid obtained by rotating R about the y-axis.

Find b so that the volume of S is 25.

6. Bob threw a rock downward from a window 300 meters above the ground. The rock was moving twice as fast after 8 seconds as it was after 3 seconds. Assuming the rock is always accelerating at $10 \; m/s^2$, how long after Bob threw the rock did it hit the ground?