Math 220 **Quiz 8 (take-home)** **Fall 2013**

Name _____

(circle your TA discussion section)

- ▷ **AD1**, TR 11:00-12:50, Sarah Loeb / Hannah Spinoza
- ▷ **AD2**, TR 9:00-10:50, M.Tip Phaovibul
- ▷ **AD3**, TR 1:00-2:50, Cara Monical
- ▷ **ADA**, TR 8:00-8:50, Nima Rasekh
- ▷ **ADB**, TR 9:00-9:50, Hong Liu
- ▷ **ADC**, TR 10:00-10:50, Hong Liu
- ▷ **ADD**, TR 11:00-11:50, Stephen Berning
- ▷ **ADE**, TR 12:00-12:50, Stephen Berning
- ▷ **ADF**, TR 1:00-1:50, Christopher Bailey
- ▷ **ADG**, TR 2:00-2:50, Christopher Bailey
- ▷ **ADH**, TR 3:00-3:50, Neriman Tokcan
- ▷ **ADI**, TR 4:00-4:50, Neriman Tokcan
- ▷ **ADJ**, TR 9:00-9:50, Nima Rasekh
- ▷ **ADK**, TR 10:00-10:50, Michael Obiero Oyengo
- ▷ **ADL**, TR 11:00-11:50, Andrew McConvey
- ▷ **ADM**, TR 12:00-12:50, Benjamin Wright
- ▷ **ADN**, TR 1:00-1:50, Benjamin Wright
- ▷ **ADO**, TR 2:00-2:50, Vanessa Rivera-Quiñones
- ▷ **ADP**, TR 3:00-3:50, Vanessa Rivera-Quiñones
- ▷ **ADR**, TR 9:00-9:50, Michael Santana
- ▷ **ADS**, TR 12:00-12:50, Andrew McConvey
- ▷ **ADT**, TR 2:00-2:50, Alessandro Gondolo
- ▷ **ADU**, TR 3:00-3:50, Alessandro Gondolo

- You may work with other MATH 220 students. However each student should write up solutions separately and independently – nobody should copy someone else's work.
- You may use your notes or the textbook.
- Computers are not allowed on any problem. You may use a calculator only for basic arithmetic.
- The quiz should be submitted to your TA at the beginning of your official discussion period on Tuesday, November 5th.
- There is a higher expectation for the quality of your work on a take-home quiz. Everything should be written logically and legibly with sufficient work to justify each answer. Blank copies of the quiz are available on the course home page.
- Be sure that the pages are nicely stapled – do not just fold the corners.
- **Note to TAs and Tutors – you should not help students with these specific problems or go over solutions until after 5pm Tuesday.**

1. (2 points) The acceleration due to gravity near the surface of some planet is $-10\ m/s^2$. An object is shot upward from the surface of this planet and 8 seconds later it has fallen back to the surface. What is the velocity of this object 2.5 seconds after being shot?

2. (2 points) Find a formula for $w(t)$ given that $w''(t) = 5\cos t - 6e^t + 20t - 8$, $w'(0) = 4$ and $w(0) = 2$.

3. (2 points) Suppose that g is continuous at all real numbers, $\int_2^8 g(x)\,dx = 30$ and $\int_2^{10} g(x)\,dx = 42$. What is the value of $\int_{10}^8 (4g(x) + 5)\,dx$?

4. (2 points) Evaluate the following limit. Use proper notation throughout your evaluation of this limit.

$$\lim_{n\to\infty} \sum_{k=1}^{n} \left(\frac{14}{n^3} + \frac{12k^2}{n^3} + \frac{4k}{n^2} + \frac{3}{n} \right)$$

5. (2 points) At time t seconds, the velocity of an object is $t^3\ ft/s$. The distance in feet traveled by this object from $t = 12$ to $t = 20$ can be written as a limit of Riemann sums in many different ways. I have shown how to do this for two of the six ways indicated below. Fill in the missing information for the remaining limits so that the only variables appearing are n and k. Do not evaluate these limits.

(a) Using a limit of right Riemann sums,

$$DISTANCE = \lim_{n\to\infty} \sum_{k=1}^{n} \left[\left(12 + k \cdot \frac{8}{n}\right)^3 \cdot \frac{8}{n} \right]$$

(b) Using a limit of right Riemann sums,

$$DISTANCE = \lim_{n\to\infty} \sum_{k=0}^{n-1} \left[\qquad \right]$$

(c) Using a limit of left Riemann sums,

$$DISTANCE = \lim_{n\to\infty} \sum_{k=1}^{n} \left[\qquad \right]$$

(d) Using a limit of left Riemann sums,

$$DISTANCE = \lim_{n\to\infty} \sum_{k=0}^{n-1} \left[\qquad \right]$$

(e) Using a limit of midpoint Riemann sums,

$$DISTANCE = \lim_{n\to\infty} \sum_{k=1}^{n} \left[\qquad \right]$$

(f) Using a limit of midpoint Riemann sums,

$$DISTANCE = \lim_{n\to\infty} \sum_{k=0}^{n-1} \left[\left(12 + (k + 0.5) \cdot \frac{8}{n}\right)^3 \cdot \frac{8}{n} \right]$$