Math 220 **Quiz 8 (take-home)** **Fall 2015**

Name ____

(circle your TA discussion section)

- ▷ **AD1**, TR 11:00-12:50, Derek Jung
- ▷ **AD2**, TR 9:00-10:50, Claire Merriman
- ▷ **AD3**, TR 1:00-2:50, Itziar Ochoa de Alaiza Gracia
- ▷ **ADA**, TR 8:00-8:50, Dara Zirlin
- ▷ **ADB**, TR 9:00-9:50, Dara Zirlin
- ▷ **ADC**, TR 10:00-10:50, Xujun Liu
- ▷ **ADD**, TR 11:00-11:50, Christopher Linden
- ▷ **ADE**, TR 12:00-12:50, Christopher Linden
- ▷ **ADF**, TR 1:00-1:50, Alyssa Loving
- ▷ **ADG**, TR 2:00-2:50, Xianchang Meng
- ▷ **ADH**, TR 3:00-3:50, Xianchang Meng
- ▷ **ADI**, TR 4:00-4:50, Aaron Schneberger
- ▷ **ADJ**, TR 9:00-9:50, Elizabeth Field
- ▷ **ADK**, TR 10:00-10:50, Elizabeth Field
- ▷ **ADL**, TR 11:00-11:50, Emily Heath
- ▷ **ADM**, TR 12:00-12:50, Alyssa Loving
- ▷ **ADN**, TR 1:00-1:50, Aaron Schneberger
- ▷ **ADO**, TR 2:00-2:50, Tigran Hakobyan
- ▷ **ADP**, TR 3:00-3:50, Tigran Hakobyan
- ▷ **ADR**, TR 9:00-9:50, Xujun Liu
- ▷ **ADS**, TR 12:00-12:50, Emily Heath
- ▷ **ADT**, TR 2:00-2:50, Argen West
- ▷ **ADU**, TR 3:00-3:50, Argen West

- 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, the textbook, or information found on my course home page.
- You may use a calculator only for basic arithmetic. In particular you should not use its graphing features.
- You are not allowed to search the Internet, use Wolfram Alpha, or use technology for anything beyond what is stated above.
- 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.
- **The quiz is due at the beginning of your official discussion period on Tues., Nov. 3rd.**
- **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) Find a formula for $g(t)$ given that $g''(t) = 8\cos(t) - 2\sin(t)$, $g(0) = -2$ and $g(\pi/2) = \pi - 3$.

2. (2 points) Suppose that $w(x)$ is continuous at all real numbers and satisfies the following equations.

- $\int_6^{12} w(x)\,dx = 5$
- $\int_6^{4} w(x)\,dx = 15$
- $\int_1^{12} w(x)\,dx = 25$

What is the value of $\int_1^4 (2w(x) - 50)\ dx$?

3. (2 points) Evaluate the following limit. Use proper notation throughout your evaluation of this limit.

$$\lim_{n\to\infty}\sum_{k=1}^{n}\frac{2n^2-10kn+24k^2-42}{n^3}$$

4. (2 points) From section 5.2 we have the following property of definite integrals.

- If $f(x)$ is continuous and $m \leq f(x) \leq M$ for $a \leq x \leq b$, then $m(b-a) \leq \int_a^b f(x)\,dx \leq M(b-a)$

Use this property to carefully explain why the following inequality holds.

$$0.25 \leq \int_7^{12} \frac{1}{3\cos^3\left(x^{42}\right) + 2\sin^9\left(x^{58}\right) + 15}\,dx \leq 0.5$$

5. (2 points) At time t seconds, the velocity of an object is $v(t) = t^4 e^t \ m/s$. The distance in meters traveled by this object from $t = 3$ to $t = 8$ 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,

$$DISTANCE = \lim_{n\to\infty} \sum_{k=1}^{n} \left[\left(\left(3 + k \cdot \frac{5}{n}\right)^4 e^{\left(3+k\cdot\frac{5}{n}\right)} \right) \cdot \frac{5}{n} \right]$$

(b) Using a limit of right Riemann sums,

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

(c) Using a limit of left Riemann sums,

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

(d) Using a limit of left Riemann sums,

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

(e) Using a limit of midpoint Riemann sums,

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

(f) Using a limit of midpoint Riemann sums,

$$DISTANCE = \lim_{n\to\infty} \sum_{k=0}^{n-1} \left[\left(\left(3 + (k+0.5) \cdot \frac{5}{n}\right)^4 e^{\left(3+(k+0.5)\cdot\frac{5}{n}\right)} \right) \cdot \frac{5}{n} \right]$$