Math 220 **Quiz 8 (take-home)** **Spring 2019**

Name _____ **NetID** _____

UIN _____

Circle your TA discussion section.

- ▷ **AD1**, TR 9:00-10:50, Ran Ji
- ▷ **AD2**, TR 1:00-2:50, Cassie Christenson
- ▷ **AD3**, TR 11:00-12:50, Dana Neidinger
- ▷ **ADA**, TR 8:00-8:50, Eion Blanchard
- ▷ **ADB**, TR 9:00-9:50, Eion Blanchard
- ▷ **ADC**, TR 10:00-10:50, Yuxuan "Yuki" Zhang
- ▷ **ADD**, TR 11:00-11:50, Stathis Chrontsios
- ▷ **ADE**, TR 12:00-12:50, Kesav Krishnan
- ▷ **ADF**, TR 1:00-1:50, Souktik Roy
- ▷ **ADG**, TR 2:00-2:50, Gidon Orelowitz
- ▷ **ADH**, TR 3:00-3:50, Mina Nahvi
- ▷ **ADJ**, TR 9:00-9:50, Yuxuan "Yuki" Zhang
- ▷ **ADK**, TR 10:00-10:50, Souktik Roy
- ▷ **ADL**, TR 11:00-11:50, Gidon Orelowitz
- ▷ **ADM**, TR 12:00-12:50, Vincent Villalobos
- ▷ **ADN**, TR 1:00-1:50, Kesav Krishnan
- ▷ **ADO**, TR 2:00-2:50, Stathis Chrontsios
- ▷ **ADQ**, TR 4:00-4:50, Mina Nahvi
- ▷ **ADR**, TR 10:00-10:50, Vincent Villalobos

- You may lose points if you do not circle your correct discussion section.
- You may work with other MATH 220 students. However each student should write their 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 including old test and quiz solutions.
- You are not allowed to use a calculator, Wolfram Alpha, or any similar technology.
- 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 lecture period on Monday, April 1st.**
- **TAs and Tutors – Do not help students with these specific problems until the quizzes have been collected for all MATH 220 lectures (9-9:50am, 10-10:50am).**

1. (2 points) Determine a formula for $g(x)$ given that it satisfies the following conditions.

   - $g''(x) = 30\left(x^2 + 4x + 2\right)\left(x^2 - 2\right)$
   - $g(1) = 37$
   - $g(-1) = 5$

2. (2 points) Evaluate the following limit. Use proper notation in each step.

$$\lim_{n\to\infty} \sum_{k=1}^{n} \left(\frac{6k-4}{n^2} + \frac{30k^2 - 8n^2}{n^3} \right)$$

3. (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.

$$0.1 \leq \int_0^2 \frac{1}{4+2^{x^2}}\,dx \leq 0.4$$

4. (2 points) Suppose that $g(x)$ is continuous at all real numbers and satisfies the following equations.

   - $\int_3^9 g(x)\,dx = 30$
   - $\int_9^2 g(x)\,dx = 50$
   - $\int_3^5 g(x)\,dx = 20$

   What is the value of $\int_2^5 (4g(x) - 10)\ dx$?

5. (2 points) Consider the area between the x-axis and the graph of $f(x) = \dfrac{2x}{x^6 + 9}$ on the interval $[5, 8]$. Using proper notation, express this area in the following two ways.

   (i) A definite integral. Do not evaluate this integral.

   (ii) A limit of right Riemann sums. Do not evaluate this limit.