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.

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

\[ 0.1 \leq \int_0^2 \frac{1}{4+2^x} \, dx \leq 0.4 \]
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 $f(x) = \frac{2x}{x^6 + 9}$ 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.