**Name** _____

(circle your TA discussion section)

▷ **AD1**, TR 11:00-12:50, Melinda Lanius
▷ **AD2**, TR 9:00-10:50, Ben Fulan
▷ **AD3**, TR 1:00-2:50, Mychael Sanchez
▷ **ADA**, TR 8:00-8:50, Derek Jung
▷ **ADB**, TR 9:00-9:50, Derek Jung
▷ **ADC**, TR 10:00-10:50, Andrew McConvey
▷ **ADD**, TR 11:00-11:50, Andrew McConvey
▷ **ADE**, TR 12:00-12:50, David Poole
▷ **ADF**, TR 1:00-1:50, Alonza Terry
▷ **ADG**, TR 2:00-2:50, Alonza Terry
▷ **ADH**, TR 3:00-3:50, Argen West
▷ **ADI**, TR 4:00-4:50, Argen West

▷ **ADJ**, TR 9:00-9:50, Vanessa Rivera-Quiñones
▷ **ADK**, TR 10:00-10:50, Vanessa Rivera-Quiñones
▷ **ADL**, TR 11:00-11:50, David Poole
▷ **ADM**, TR 12:00-12:50, Iftikhar Ahmed
▷ **ADN**, TR 1:00-1:50, Kaiwen Liu
▷ **ADO**, TR 2:00-2:50, Hannah Burson
▷ **ADP**, TR 3:00-3:50, Hannah Burson
▷ **ADR**, TR 9:00-9:50, Stephen Berning
▷ **ADS**, TR 12:00-12:50, Sarah Mousley
▷ **ADT**, TR 2:00-2:50, Kaiwen Liu
▷ **ADU**, TR 3:00-3:50, Iftikhar Ahmed

- 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.

- 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 lecture period on Friday, November 20.**

- **Note to TAs and Tutors – you should not help students with these specific problems or go over solutions until after 5pm Friday.**

1. (4 points) A calculator gives an estimate of $0.0769610411$ for the value of $3\ln(3) - 2\ln(5)$. Using the techniques of linear approximation found in section 3.10, show that you are able to obtain a very similar estimate of $0.08$ without the use of any technology.

2. (2 points) Suppose that the functions $f(x)$ and $g(x)$ are differentiable everywhere. Some values for these functions and their derivatives are given in the table.

| $x$ | $f(x)$ | $f'(x)$ | $g(x)$ | $g'(x)$ |
|-----|--------|---------|--------|---------|
| 1 | 2 | $-4$ | $-2$ | $-7$ |
| 2 | 5 | 6 | $-1$ | 5 |
| 3 | 10 | 4 | 4 | 5 |
| 4 | 17 | 14 | 13 | 17 |

Let $w(x) = (f \circ g)(x)$. Use the techniques of linear approximation found in section 3.10 to estimate the value of $w(2.99)$. Simplify and write your answer in decimal form.

3. (4 points) The graph of $f(x) = x^7 + x^5 + x^3 - 50x^2 - 314x - 42$ has precisely one inflection point. Determine the $x$-value for this inflection point using Newton's Method with an initial estimate of $x_1 = 2$. You should use this method 3 times in order to obtain estimates $x_2$, $x_3$ and $x_4$. You are only allowed to use technology for basic arithmetic. Each estimate you obtain should include at least 5 places after the decimal point.