

Name \_\_\_\_\_

(circle your TA discussion section)

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

- 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 Mr. Murphy at the beginning of your official lecture period on Friday, October 18th.
- 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 Friday.**

1. (3 points) Evaluate  $\lim_{x \rightarrow 0^+} \left( \frac{1}{x} - \frac{1}{2^x - 1} \right)$

2. (4 points) Let  $f(x) = x^5 - 15x^3$

(a) Find the intervals where  $f$  is increasing and where  $f$  is decreasing.

(b) Find the local maximum and minimum values.

(c) Find the intervals of concavity and the inflection points.

3. (3 points) A steam pipe must be buried underground to reach from one corner of a rectangular parking lot to the diagonally opposite corner. The dimensions of the parking lot are 500 feet by 800 feet. It costs 5 dollars per foot to lay steam pipe under the pavement but only 3 dollars per foot to lay the pipe along one of the long edges of the parking lot. Because of nearby sidewalks, the pipe cannot be laid along the 500-foot sides of the parking lot. How should the steam pipe be buried so as to cost as little as possible?