Calculus 1, Handwritten Homework 5 — Spring 2022

NAME _____ STUDENT NUMBER _____

Write in complete sentences and use correct notation (such as equal signs and limit notation). Give justifications for your claims using the definitions and theorems in the notes and book (quote them by name or number, as is done in the examples in the notes and videos, and in the solutions posted online). Give precise values, not numerical (calculator) approximations. If provided, put your final answer in the box. Each numbered problem is worth 5 points. Print out this document, work the problem, scan your solutions, and submit the scan of (in PDF) to the D2L DropBox by the deadline. See the online syllabus for deadlines. **Do not copy work from others or from the internet! This will result in you being charged with academic misconduct.**

1. Use the limit definition of derivative to find $f'(x)$ when $f(x) = 1 + \sqrt{4-x}$. Justify any limit computations. The is similar to Exercise 18 in Section 3.2.

2. Consider $f(x) = \dfrac{3x^4 - 7x}{(x^2 + x + 3)(x^4 - 9x + 2e^x)}$. Find the derivative $f'(x)$. Use the rules of differentiation (the Product Rule and Quotient Rule) and the square bracket notation. Do not simplify, just leave your answer in terms of products, quotients, and square brackets.

3. A baseball is thrown directly upward and at time t seconds after it is released it has a height of $s = 128t - 16t^2$ feet. (a) How long will the baseball be aloft? (b) How high will the baseball go? (c) What is the velocity of the base ball when it hits the ground?