

Calculus 1, Handwritten Homework 2 — Spring 2022

NAME _____ STUDENT NUMBER _____

Write in complete sentences and use correct notation (such as equal signs). 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 7.5 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. Consider the limit $\lim_{x \rightarrow 2} \frac{x - 2}{\sqrt{x^2 + 5} - 3}$. If the limit does not exist, then explain why. If it does exist then find its value. Use the FCS method described in the notes and videos. Quote theorems from the section and make sure to use Dr. Bob's Limit Theorem. This is Exercise 40 in Section 2.2.

2. Consider $f(x) = x^2 + 7$, $L = 16$, $c = 3$, and $\varepsilon = 1$. Find the largest open interval about c on which the inequality $|f(x) - L| < \varepsilon$ holds. Then give the largest value for $\delta > 0$ such that for all x satisfying $0 < |x - c| < \delta$, the inequality $|f(x) - L| < \varepsilon$ holds. You will find that a graph is useful.

