

Calculus 1, Handwritten Homework 11 — 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 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, 2. A customer has asked you to design an open-top rectangular stainless steel vat. It is to have a square base and a volume of 32 ft^3 , to be welded from quarter-inch plate, and to weigh no more than necessary. What dimensions to you recommend? Find the surface area S as a function and find the minimum of S (make sure you confirm that you have found a minimum and not a maximum). Use the 5 steps of Section 4.6. This is Exercise 106 of the Chapter 4 Practice Exercises.



- 3.** Use Newton's method to estimate the negative fourth root of 2 by solving the equation $x^4 - 2 = 0$. Start with $x_0 = -1$ and find x_2 . This is Exercise 6 of Section 4.7.

