Calculus 1, Handwritten Homework 4 — 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. Consider $y = \dfrac{x^3}{x^3 - 8}$. Find all horizontal and vertical asymptotes, justifying any limits you compute (you may need Dr. Bob's Infinite Limits Theorem). Then graph $y = f(x)$ in such a way as to reflect the asymptotic behavior. This is Exercise 74 in Section 2.6.

3. Consider the function $f(x) = \sqrt{x}$. Use the limit definition to find the derivative of f at the point $x_0 = 4$ (justify your computations, as usual). Then find the equation of the tangent line to $y = \sqrt{x}$ at the point $(4, 2)$. Graph $y = f(x)$ and the tangent line together.