

## Calculus 1, Handwritten Homework 9 — 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. Find the absolute maximum and minimum values of  $g(x) = e^{-x^2}$  on the interval  $[-2, 1]$ . Then graph  $y = g(x)$  and identify the points on the graph where the absolute extrema occur. Follow the three steps introduced in the Notes at the end of Section 4.1. This is Exercise 44 in Section 4.1.



2. Find the function  $f$  with derivative  $f'(t) = \sec t \tan t - 1$  whose graph passes through the point  $P(0, 0)$ . Explain your reasoning by quoting the relevant results from Section 4.2. This is Exercise 42 in Section 4.2.



- 3. (a)** Find the open intervals on which the function  $k(x) = x^{2/3}(x^2 - 4)$  is increasing and decreasing. Use the critical points of  $k$  to make a table of the sign of  $k'$  using test values from the intervals on which  $k'$  has the same sign. **(b)** Identify the local extreme values of  $k$ , if any. This is Exercise 40 in Section 4.3.

