

# MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

ASSIGNMENT 1

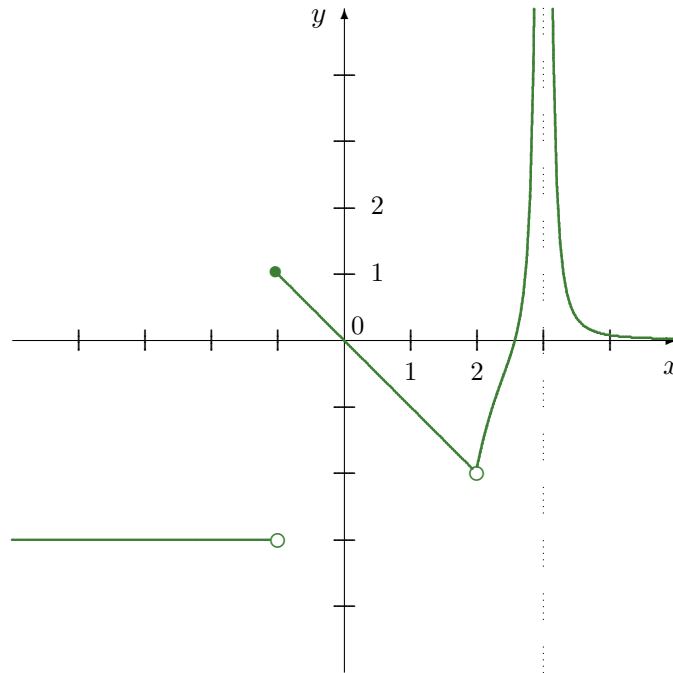
MATHEMATICS 1000

FALL 2022

**Due: Wednesday, September 21st, 2022 at 11:59pm.** See the Gradescope Handout for submission information.

**Note:** You should complete Worksheet 1.2 before you work on this assignment. You should also complete the “Getting Started for Math 1000” WebAssign practice problem set if you haven’t already done so.

1. Use the graph of  $y = f(x)$  below to determine each of the following. If the value of the function is undefined or the limit does not exist, indicate this (but label these limits as  $\infty$  or  $-\infty$  where appropriate).



- |             |                                      |                                      |                                    |
|-------------|--------------------------------------|--------------------------------------|------------------------------------|
| (a) $f(-1)$ | (b) $\lim_{x \rightarrow -1^-} f(x)$ | (c) $\lim_{x \rightarrow -1^+} f(x)$ | (d) $\lim_{x \rightarrow -1} f(x)$ |
| (e) $f(2)$  | (f) $\lim_{x \rightarrow 2^-} f(x)$  | (g) $\lim_{x \rightarrow 2^+} f(x)$  | (h) $\lim_{x \rightarrow 2} f(x)$  |
| (i) $f(3)$  | (j) $\lim_{x \rightarrow 3^-} f(x)$  | (k) $\lim_{x \rightarrow 3^+} f(x)$  | (l) $\lim_{x \rightarrow 3} f(x)$  |

**PLEASE TURN OVER**

2. Consider the function

$$f(x) = \frac{2x^2 + 7x - 4}{x^3 + 6x^2 + 9x + 4}.$$

Investigate each of the following limits by constructing a table of values to find the lefthand and righthand limits. Use the one-sided limits to determine the (two-sided) limit, if it exists. Assign  $\infty$  or  $-\infty$  where appropriate.

(a)  $\lim_{x \rightarrow -4} f(x)$

(b)  $\lim_{x \rightarrow -1} f(x)$