

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

ASSIGNMENT 2

MATHEMATICS 1000

FALL 2022

Due: Wednesday, September 28th, 2022 at 11:59pm. Show all work. See the Grade-scope Handout for submission information.

Note: You should complete the WebAssign problem sets “Basic Limit Properties” and “Evaluating Limits Algebraically”, as well as Worksheets 1.3 and 1.4, before you work on this assignment.

1. Use analytical methods to evaluate each of the following limits. If a limit does not exist, explain why (but assign ∞ or $-\infty$ to the limit where appropriate).

(a) $\lim_{h \rightarrow 3} \frac{6 + h - h^2}{\sqrt{5h - 6} - \sqrt{h + 6}}$

(b) $\lim_{x \rightarrow -1} [7(x^2 + 3x + 2)^{-1} - (x + 8)(x + 1)^{-1}]$

(c) $\lim_{t \rightarrow 0} \frac{4}{t \cot(7t)}$

2. Determine all the vertical asymptotes, if any, of the function

$$f(x) = \frac{x^2 + 2x}{x^5 - 4x^3}.$$

For each vertical asymptote, assign $\pm\infty$ to the lefthand and righthand limits.