MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

SECTION 1.7 **Math 1000 Worksheet** FALL 2024

For practice only. Not to be submitted.

1. For each function $f(x)$, use the definition of continuity to determine all points at which $f(x)$ is not continuous. Classify any discontinuities.

   (a) $f(x) = \begin{cases} \dfrac{x^2-4}{x-2} & \text{if } x \neq 2 \\ 0 & \text{if } x = 2 \end{cases}$

   (b) $f(x) = \begin{cases} \dfrac{x+1}{x^2-x-2} & \text{if } x < 1 \\ 2 & \text{if } x = 1 \\ 3 - x^2 & \text{if } x > 1 \end{cases}$

   (c) $f(x) = \begin{cases} \dfrac{x}{x^2-5x} & \text{if } x < 1 \\ \dfrac{2}{x-9} & \text{if } x \geq 1 \end{cases}$

2. Show that $f(x) = 3 + 4x^2 - 5x^3$ has at least one root on the interval $[-2, 2]$.