

# MEMORIAL UNIVERSITY OF NEWFOUNDLAND

## DEPARTMENT OF MATHEMATICS AND STATISTICS

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SECTION 1.7

Math 1000 Worksheet

FALL 2023

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**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.

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

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

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

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