

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

SECTION 1.6

Math 1000 Worksheet

FALL 2023

For practice only. Not to be submitted.

1. Determine whether the function

$$f(x) = \begin{cases} \frac{x^2 + 4}{2x^2 + 4} & \text{if } x \leq -2 \\ \frac{x^2 - 4}{2x + 4} & \text{if } -2 < x \leq 1 \\ \frac{x^2 - 4}{x^2 - 9x + 14} & \text{if } x > 1 \end{cases}$$

is continuous at the indicated point. If it is not, classify the discontinuity as removable or non-removable.

- (a) $x = -2$
- (b) $x = 1$
- (c) $x = 2$

2. Find all values of the constant k which would make $f(x)$ continuous at $x = 1$, given

$$f(x) = \begin{cases} \frac{x^2 + (k-1)x - k}{x-1} & \text{if } x \neq 1 \\ 2k + 3 & \text{if } x = 1. \end{cases}$$

3. Find all values of the constant k which would make $f(x)$ continuous at $x = 2$, given

$$f(x) = \begin{cases} k^2x - 5 & \text{if } x \geq 2 \\ \frac{1}{x-4} & \text{if } x < 2. \end{cases}$$

4. Find all values of the constant k which would make $f(x)$ continuous at $x = 0$, given

$$f(x) = \begin{cases} \frac{\sqrt{kx^2 + 1} - 1}{3x^2} & \text{if } x \neq 0 \\ k + \frac{5}{6} & \text{if } x = 0. \end{cases}$$