MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

SECTION 1.3 **Math 1000 Worksheet** FALL 2024

For practice only. Not to be submitted.

1. Given that $\lim_{x\to p} f(x) = -5$ and $\lim_{x\to p} g(x) = 4$, find each of the following.

   (a) $\lim_{x\to p}[f(x) - g(x)]$ (b) $\lim_{x\to p}[g(x) - 2f(x)]$

   (c) $\lim_{x\to p} \dfrac{f(x)}{g(x)}$ (d) $\lim_{x\to p} f(x)\sqrt{g(x)}$

2. Evaluate each of the following limits.

   (a) $\lim_{x\to 5}(x^2 - 9x + 3)$ (b) $\lim_{x\to -3} \dfrac{\sqrt{1-x}}{x}$

   (c) $\lim_{h\to 0} \dfrac{\cos(h)}{2^h}$ (d) $\lim_{x\to 2} \dfrac{|x-2|}{x-2}$

3. Given

$$f(x) = \begin{cases} \cos(x) & \text{for } x \le 0 \\ 1 - 4x & \text{for } 0 < x \le 3 \\ \frac{9}{x} & \text{for } x > 3 \end{cases}$$

   determine each of the following limits, or explain why the limit does not exist.

   (a) $\lim_{x\to -\frac{\pi}{6}} f(x)$ (b) $\lim_{x\to 0} f(x)$ (c) $\lim_{x\to 3} f(x)$

4. Find all values of k for which $\lim_{x\to -2} f(x)$ exists, given

$$f(x) = \begin{cases} k^2 x, & \text{for } x < -2 \\ k - 6, & \text{for } x = -2 \\ 4k - x, & \text{for } x > -2 \end{cases}$$