

# MEMORIAL UNIVERSITY OF NEWFOUNDLAND

## DEPARTMENT OF MATHEMATICS AND STATISTICS

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SECTION 1.3

Math 1000 Worksheet

FALL 2023

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**For practice only. Not to be submitted.**

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

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

(c)  $\lim_{x \rightarrow p} \frac{f(x)}{g(x)}$                       (d)  $\lim_{x \rightarrow p} f(x)\sqrt{g(x)}$

2. Evaluate each of the following limits.

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

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

3. Given

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

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

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

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

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