

Names: _____

Group #: _____

1. Given $\lim_{x \rightarrow 1} f(x) = 2$, $\lim_{x \rightarrow 1} g(x) = -3$, $\lim_{x \rightarrow 1} h(x) = 5$, compute the following:

(a) $\lim_{x \rightarrow 1} (f(x) + g(x))$

(b) $\lim_{x \rightarrow 1} (g(x) - h(x))$

(c) $\lim_{x \rightarrow 1} (f(x) \cdot h(x))$

(d) $\lim_{x \rightarrow 1} (3f(x))^2$

(e) $\lim_{x \rightarrow 1} \left(\frac{g(x)}{h(x)} \right)$

2. Consider the piecewise-defined function

$$f(x) = \begin{cases} 0 & : x < -5 \\ \sqrt{25 - x^2} & : -5 \leq x < 4 \\ 5x & : x \geq 4 \end{cases}$$

Determine the following limits:

(a) $\lim_{x \rightarrow -5^+} f(x)$

(d) $\lim_{x \rightarrow 4^+} f(x)$

(b) $\lim_{x \rightarrow -5^-} f(x)$

(e) $\lim_{x \rightarrow 4^-} f(x)$

(c) $\lim_{x \rightarrow -5} f(x)$

(f) $\lim_{x \rightarrow 4} f(x)$

3. $\lim_{x \rightarrow 0} (x - 8)^{2/3}$

4. $\lim_{x \rightarrow -1} \frac{x^2 - 3x - 4}{x^2 + 2x - 3}$

5. $\lim_{x \rightarrow 2} \frac{x^2 + 3x - 10}{x - 2}$

6. $\lim_{x \rightarrow 1} \frac{x - 1}{\sqrt{x} - 1}$

$$7. \lim_{x \rightarrow 3} \frac{\sqrt{x^2 + 7} - 4}{x - 3}$$

$$8. \lim_{x \rightarrow 0} \frac{e^{2x} - 1}{2e^x - 2}$$

$$9. \lim_{x \rightarrow \frac{\pi}{2}} \frac{1 - \sin^2 x}{2 \cos x}$$