Names: _____ Group #: _____

1. Given $\lim_{x\to 1} f(x) = 3$, $\lim_{x\to 1} g(x) = -2$, $\lim_{x\to 1} h(x) = 7$, compute the following:

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

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

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

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

   (e) $\lim_{x\to 1}\left(\dfrac{g(x)}{h(x)}\right)$

2. Consider the piecewise-defined function

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

   Determine the following limits:

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

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

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

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

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

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

3. $\lim_{x\to 0}(2x-8)^{1/3}$

4. $\lim_{x\to -1}\dfrac{x^2-3x-4}{x^2+2x-3}$

5. $\lim_{x\to 5}\dfrac{2x^2-7x-15}{x-5}$

6. $\lim_{x\to 1}\dfrac{x-1}{\sqrt{x}-1}$

7. $\lim_{x \to -1} \dfrac{\sqrt{x^2 + 8} - 3}{x + 1}$

8. $\lim_{x \to 0} \dfrac{e^{2x} - 1}{3e^x - 3}$

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