Name_____ Date_____ Period_____

Properties of Limits

Show all work. Unless stated otherwise, no calculator permitted.

Short Answer

1. Given that $\lim_{x\to a} f(x) = -3$, $\lim_{x\to a} g(x) = 0$, $\lim_{x\to a} h(x) = 8$, for some constant a, find the limits that exist. If the limit does not exist, explain why.

(a) $\lim_{x\to a}\left[f(x)+h(x)\right] =$

(b) $\lim_{x\to a}\left[f(x)\right]^2 =$

(c) $\lim_{x\to a}\sqrt[3]{h(x)} =$

(d) $\lim_{x\to a}\dfrac{1}{f(x)} =$

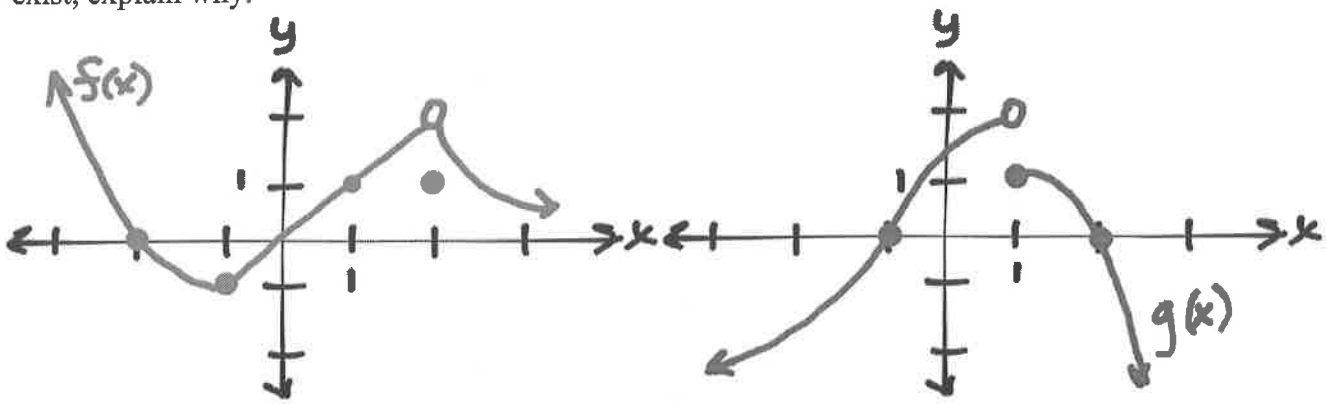
(e) $\lim_{x\to a}\dfrac{f(x)}{h(x)} =$

(f) $\lim_{x\to a}\dfrac{g(x)}{f(x)} =$

(g) $\lim_{x\to a}\dfrac{f(x)}{g(x)} =$

(h) $\lim_{x\to a}\dfrac{2f(x)}{h(x)-f(x)} =$

2. The graphs of f and g are given below. Use them to evaluate each limit, if it exists. If the limit does not exist, explain why.



(a) $\lim_{x\to 2}\left[f(x)+g(x)\right]=$

(b) $\lim_{x\to 1}\left[2f(x)-3g(x)\right]=$

(c) $\lim_{x\to 0}\left[f(x)g(x)\right]=$

(d) $\lim_{x\to -1}\dfrac{f(x)}{g(x)}=$

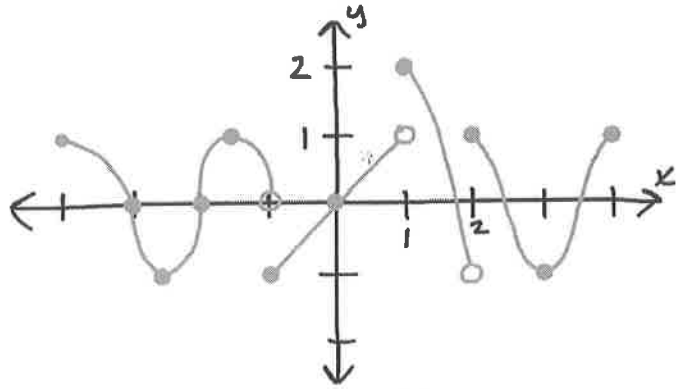
(e) $\lim_{x\to 2}x^3 f(x)=$

(f) $\lim_{x\to 1^-}f\left(g(x)\right)=$

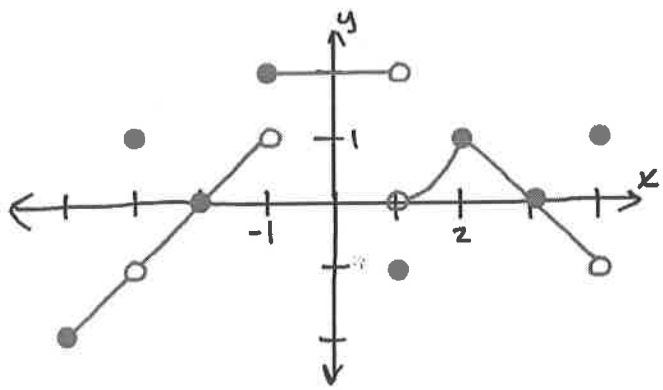
Multiple Choice

_____ 3. Suppose $2 \le f(x) \le (1-x)^2 + 2$ for all $x \ne 1$ and that $f(1)$ is undefined. What is $\lim_{x \to 1} f(x)$?

(A) 3 (B) 2 (C) 4 (D) $\frac{5}{2}$ (E) 1



graph of $f(x)$



graph of $g(x)$

Use the graphs of the function $f(x)$ and $g(x)$ shown above to answer questions 7 – 9.

_____ 4. $\lim_{x \to 2^-} \left(\frac{f(x)}{g(x)} \right) =$

(A) 1 (B) −1 (C) 2 (D) −2 (E) DNE

_____ 5. $\lim_{x \to -3^-} f(g(x)) =$

(A) 0 (B) −1 (C) 2 (D) 1 (E) DNE

_____ 6. $g(1) + \lim_{x \to -1^+} x \cdot f(x) =$

(A) 0 (B) −1 (C) 2 (D) 1 (E) DNE