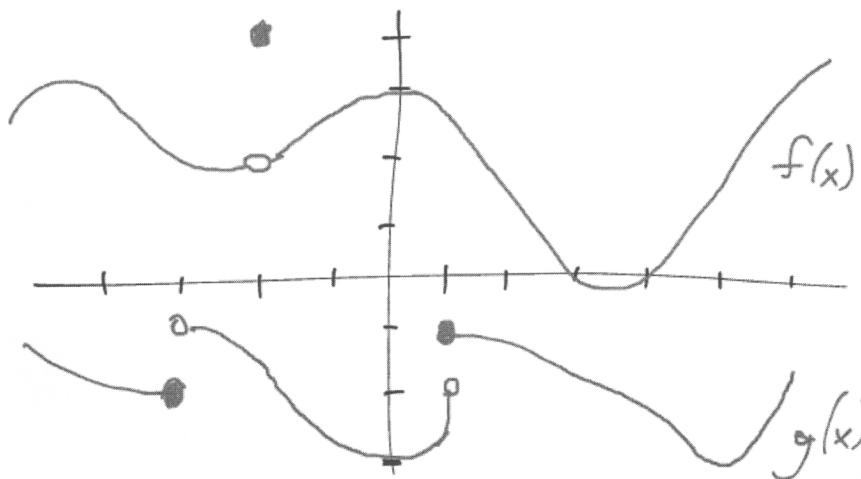


Your Name: *Key*

Calculus I, Math 151-06, Quiz #1, Form A

1. [13 points total]



[1 point each] Use the picture to determine the following.

(a) $\lim_{x \rightarrow -2^-} f(x) = 2$ (b) $\lim_{x \rightarrow -2^+} f(x) = 4$ (c) $\lim_{x \rightarrow -2} f(x) = \text{DNE}$ (d) $f(-2) = 4$

(e) $\lim_{x \rightarrow 1^-} g(x) = -2$ (f) $\lim_{x \rightarrow 1^+} g(x) = -1$ (g) $\lim_{x \rightarrow 1} g(x) = \text{DNE}$ (h) $g(1) = -1$

(i) [2 points] $\lim_{x \rightarrow 5} (2f(x) + 3g(x)) = 2 \lim_{x \rightarrow 5} f(x) + 3 \lim_{x \rightarrow 5} g(x)$
 $= 2(2) + 3(-3) = -5$

(j) [3 points] $\lim_{x \rightarrow -3^+} \frac{f(x+3)}{g(x)} = \frac{\lim_{x \rightarrow -3^+} f(x+3)}{\lim_{x \rightarrow -3^+} g(x)} = \frac{\lim_{x \rightarrow 0^+} f(x)}{\lim_{x \rightarrow -3^+} g(x)} = \frac{3}{-2} = -\frac{3}{2}$

2. [12 points total] Evaluate the following limits.

(a) [5 points] $\lim_{t \rightarrow 3} \frac{t^2 + 7t - 12}{t^2 - 9}$

$$\lim_{t \rightarrow 3} \frac{t^2 - 7t + 12}{t^2 - 9} = \frac{3^2 - 21 + 12}{3^2 - 9} = \frac{0}{0}$$

$$\lim_{t \rightarrow 3} \frac{(t-4)(t-3)}{(t+3)(t-3)}$$

$$= \lim_{t \rightarrow 3} \frac{(t-4)(t-3)}{(t+3)(t-3)} = \lim_{t \rightarrow 3} \frac{t-4}{t+3} = \frac{3-4}{3+3}$$

$$= \boxed{-\frac{1}{6}}$$

(b) [7 points] $\lim_{h \rightarrow 0} \frac{f(2+h) - f(2)}{h}$, where $f(x) = \frac{3}{x}$.

$$= \lim_{h \rightarrow 0} \frac{\frac{3}{2+h} - \frac{3}{2}}{h} = \frac{0}{0}$$

$$= \lim_{h \rightarrow 0} \frac{\frac{3 \cdot 2}{(2+h)(2)} - \frac{3(2+h)}{(2+h)(2)}}{h} = \lim_{h \rightarrow 0} \frac{6 - (6+3h)}{(2+h)(2)} \cdot \frac{1}{h}$$

$$= \lim_{h \rightarrow 0} \frac{-3h}{(2+h)(2)(h)} = \lim_{h \rightarrow 0} \frac{-3}{(2+h)(2)} = \frac{-3}{(2)(2)} = \boxed{-\frac{3}{4}}$$