Calculus 1 Quiz 2 Warm up

Calculus 1 Spring 2025

1) Given that

$$\lim_{x\to 2} f(x) = 4 \qquad \lim_{x\to 2} g(x) = -2 \qquad \lim_{x\to 2} h(x) = 0 \tag{1}$$

Find the limit if it exists. If it does not exist, explain why.

a) $\lim_{x\to 2}[f(x) + 5g(x)]$

b) $\lim_{x\to 2} \sqrt{f(x)}$

c) $\lim_{x\to 2} \frac{g(x)}{h(x)}$

2) Let

$$g(x) = \begin{cases} x & \text{if } x < 1 \\ 3 & \text{if } x = 1 \\ 2 - x^2 & \text{if } 1 < x \leq 2 \\ x - 3 & \text{if } x > 2 \end{cases} \tag{2}$$

Evaluate each of the following, if it exists, if it does not, explain why.

a) $\lim_{x\to 1^-} g(x)$

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

c) $g(1)$

d) $\lim_{x\to 2^-} g(x)$

e) $\lim_{x\to 2^+} g(x)$

f) $\lim_{x\to 2} g(x)$

3) For the function $f(x)$ whose graph is given below, answer the following questions.

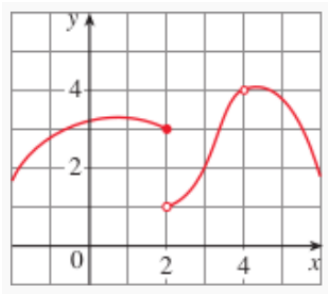

FIG. 1

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

b) $\lim_{x\to 3^-} f(x)$

c) $\lim_{x\to 3^+} f(x)$

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

3) Use the squeeze theorem to show that

$$\lim_{x\to 0} x^2 cos(20\pi x) = 0 \tag{3}$$