

1. Let

$$f(x) = \begin{cases} \sqrt{-x} & \text{if } x < 0 \\ 3 - x & \text{if } 0 \leq x < 3 \\ (x - 3)^2 & \text{if } x > 3 \end{cases}$$

(a) Evaluate each limit, if it exists.

(i) $\lim_{x \rightarrow 0^+} f(x)$

(ii) $\lim_{x \rightarrow 0^-} f(x)$

(iii) $\lim_{x \rightarrow 0} f(x)$

(iv) $\lim_{x \rightarrow 3^+} f(x)$

(v) $\lim_{x \rightarrow 3^-} f(x)$

(vi) $\lim_{x \rightarrow 3} f(x)$

(b) Where is f discontinuous? Explain.

(c) Sketch the graph of f .

2. Find the limit.

(a) $\lim_{x \rightarrow -5^-} \frac{1}{x + 5}$

(b) $\lim_{x \rightarrow -\infty} \frac{1 - 2x^2 - x^4}{5 + x - 3x^4}$

(c) $\lim_{x \rightarrow \infty} \cos x$

3. P. 75 #8

4. P. 75 #16

5. P. 75 #19

6. P. 76 #28