WORKSHEET #2 (1.4)

1. Let \( f(x) = \begin{cases} x^2 + 1, & x \leq 0 \\ 2x - 3, & x > 0 \end{cases} \)

Find each limit if it exists

a. \( \lim_{x \to 0^-} f(x) \)

b. \( \lim_{x \to 0^+} f(x) \)

c. \( \lim_{x \to 0} f(x) \)

2. At which value(s) of \( x \) is \( f(x) \) discontinuous?

\[ f(x) = \frac{x - 4}{x^2 - x - 2} \]

3. Find \( x \) values (if any) at which \( f(x) = \frac{|x|}{x} \) is discontinuous

Are they removable or nonremovable?

4. For which of the following statements is not true of \( f(x) = \sqrt{x^2 - 25} \)?

a. \( f \) is continuous @ \( x=10 \)

b. \( f \) is continuous on \((-\infty,-5)\)

c. \( f \) is continuous on \([5, \infty)\)

d. \( f \) is continuous on \([-5,5]\)

e. none of these