

Intuitive Approach to Limits

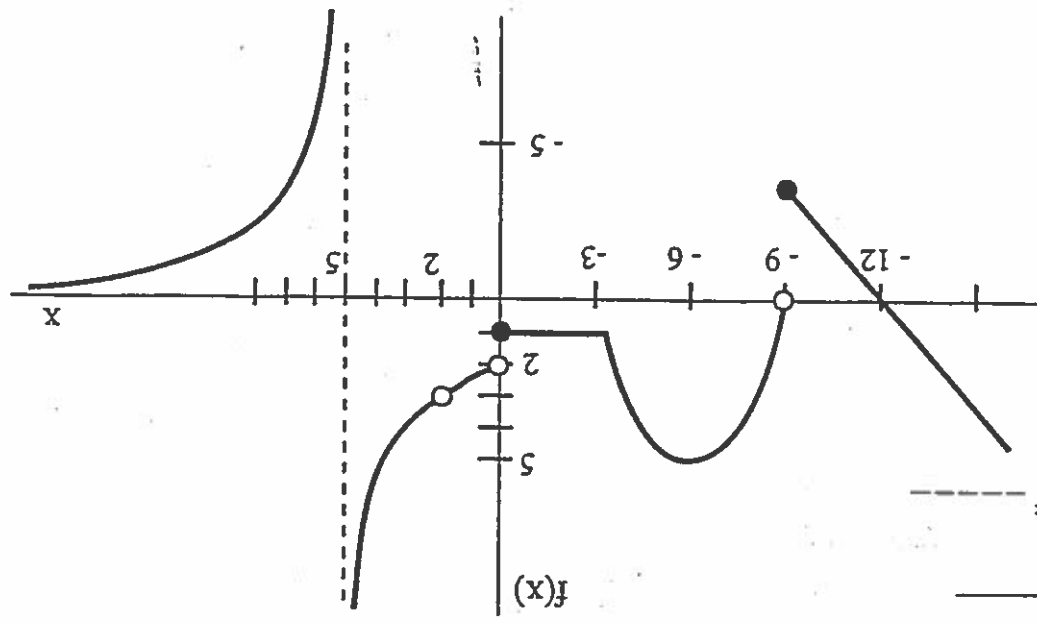
Based on the graph below:

Determine:

- i) $\lim_{x \rightarrow -12} f(x) =$ _____
- ii) $\lim_{x \rightarrow -9}^+ f(x) =$ _____
- iii) $\lim_{x \rightarrow 5} f(x) =$ _____
- iv) $\lim_{x \rightarrow -9} f(x) =$ _____
- v) $\lim_{x \rightarrow 6}^+ f(x) =$ _____
- vi) $\lim_{x \rightarrow 0}^+ f(x) =$ _____
- vii) $\lim_{x \rightarrow -6} f(x) =$ _____
- viii) $\lim_{x \rightarrow -3}^+ f(x) =$ _____
- ix) $\lim_{x \rightarrow 2}^+ f(x) =$ _____
- x) $\lim_{x \rightarrow -3} f(x) =$ _____
- xi) $\lim_{x \rightarrow 0}^- f(x) =$ _____
- xii) $\lim_{x \rightarrow 5}^+ f(x) =$ _____
- xiii) $\lim_{x \rightarrow -12}^+ f(x) =$ _____
- xiv) $\lim_{x \rightarrow 2} f(x) =$ _____

State whether or not the following limits exist. State the values of those limits that do exist.

- i) $\lim_{x \rightarrow -12} f(x) =$ _____
- ii) $\lim_{x \rightarrow 5} f(x) =$ _____
- iii) $\lim_{x \rightarrow -3} f(x) =$ _____
- iv) $\lim_{x \rightarrow -6} f(x) =$ _____
- v) $\lim_{x \rightarrow -9} f(x) =$ _____
- vi) $\lim_{x \rightarrow 2} f(x) =$ _____
- vii) $\lim_{x \rightarrow 0} f(x) =$ _____
- viii) $\lim_{x \rightarrow \infty} f(x) =$ _____

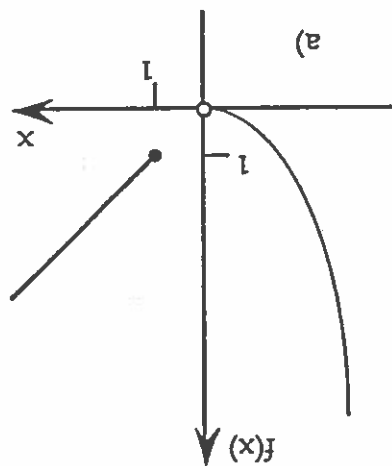


2. a) Given the function defined by:

$$f(x) = \begin{cases} x & \text{if } x \geq 1 \\ x^2 & \text{if } x < 0 \end{cases}$$

explain why:

$$\lim_{x \rightarrow 1} f(x) \neq 1$$

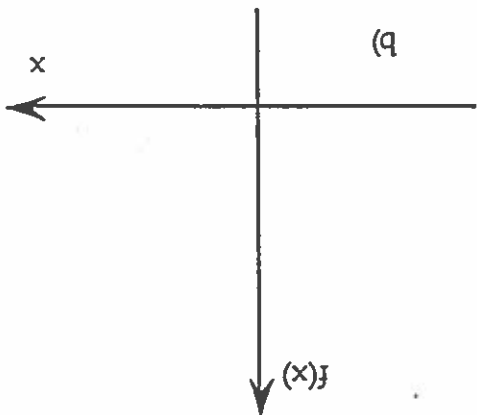


b) Let the function f be defined by:

$$f(x) = \begin{cases} x - 2 & \text{if } x \neq 4 \\ 1 & \text{if } x = 4 \end{cases}$$

i) Draw the graph of this function.

$$\text{ii) } \lim_{x \rightarrow 4} f(x) = ?$$



3. By drawing the graph for each of the following, find the limits:

a) $\lim_{x \rightarrow 0^+} |x - 2| = \underline{\hspace{2cm}}$

b) $\lim_{x \rightarrow 0^+} \sqrt{x} = \underline{\hspace{2cm}}$

b) $\lim_{x \rightarrow 1} (x^2 - 2) = \underline{\hspace{2cm}}$

