

الف) $\lim_{x \rightarrow 2^+} f(x) - 3 = f(2) - 3 = \boxed{5}$

ب) $\lim_{x \rightarrow 2^-} f(x) - 3 = \boxed{5}$

الف) $\lim_{x \rightarrow 2^+} f[x] - 3 = f[\underbrace{2^+}_2] - 3 = \boxed{5}$

ب) $\lim_{x \rightarrow 2^-} f[x] - 3 = f[\underbrace{2^-}_1] - 3 = \boxed{1}$

الف) $\lim_{x \rightarrow 2^+} [f(x) - 3] = [f(2^+) - 3] = [5^+] = \boxed{5}$

ب) $\lim_{x \rightarrow 2^-} [f(x) - 3] = [f(2^-) - 3] = [5^-] = \boxed{4}$

الف) $\left[\lim_{x \rightarrow 2^+} f(x) - 3 \right] = f(2) - 3 = [5] \quad [5] = \boxed{5}$

ب) $\left[\lim_{x \rightarrow 2^-} f(x) - 3 \right] = f(2) - 3 = [5] \quad [5] = \boxed{5}$

الف) $\lim_{x \rightarrow 3} \frac{f(x) - 3}{x - 3} \begin{cases} \xrightarrow{+} \lim_{x \rightarrow 3^+} \frac{f(x) - 3}{x - 3} = \frac{9}{0^+} = +\infty \\ \xrightarrow{-} \lim_{x \rightarrow 3^-} \frac{f(x) - 3}{x - 3} = \frac{9}{0^-} = -\infty \end{cases}$

ب) $\lim_{x \rightarrow 3} \frac{f(x) - 3}{(x - 3)^2} = \frac{9}{0^+} = \boxed{+\infty}$

$$\text{الف) } \lim_{x \rightarrow 3} \frac{x^2 - 3}{\sqrt{x} - 3} \rightarrow \begin{cases} \lim_{x \rightarrow 3^+} \frac{x^2 - 3}{\sqrt{x} - 3} = \frac{9}{\sqrt{0^+}} = +\infty \\ \lim_{x \rightarrow 3^-} \frac{x^2 - 3}{\sqrt{x} - 3} = \frac{9}{\sqrt{0^-}} = -\infty \end{cases}$$

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$$\text{ب) } \lim_{x \rightarrow 3} \frac{x^2 - 3}{\sqrt{x^2 - 4x + 3}} \rightarrow \begin{cases} \lim_{x \rightarrow 3^+} \frac{x^2 - 3}{\sqrt{x^2 - 4x + 3}} = \frac{9}{\sqrt{0^+}} = +\infty \\ \lim_{x \rightarrow 3^-} \frac{x^2 - 3}{\sqrt{x^2 - 4x + 3}} = \frac{9}{\sqrt{0^-}} = -\infty \end{cases}$$

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$$\text{الف) } \lim_{x \rightarrow 3} \frac{x^2 - 3}{x^2 - 7x + 12} \rightarrow \begin{cases} \lim_{x \rightarrow 3^+} \frac{x^2 - 3}{x^2 - 7x + 12} = \frac{9}{0^-} = -\infty \\ \lim_{x \rightarrow 3^-} \frac{x^2 - 3}{x^2 - 7x + 12} = \frac{9}{0^+} = +\infty \end{cases}$$

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$$\text{ب) } \lim_{x \rightarrow 3} \frac{x^2 - 3}{[x - 3]} \rightarrow \begin{cases} \lim_{x \rightarrow 3^+} \frac{x^2 - 3}{[x - 3]} = \frac{9}{[0^+]} = +\infty \\ \lim_{x \rightarrow 3^-} \frac{x^2 - 3}{[x - 3]} = \frac{9}{[0^-]} = -\infty \end{cases}$$

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$$\text{الف) } \lim_{x \rightarrow 3} [3x] + [-2x] \rightarrow \begin{cases} \lim_{x \rightarrow 3^+} [3x] + [-2x] = [9^+] + [-6^+] = 9 - 6 = 3 \\ \lim_{x \rightarrow 3^-} [3x] + [-2x] = [9^-] + [-6^-] = 8 - 6 = 2 \end{cases}$$

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$$\text{ب) } \lim_{x \rightarrow -2} [-4x] + [2x] \rightarrow \begin{cases} \lim_{x \rightarrow -2^+} [-4x] + [2x] = [8^+] + [-4^+] = 8 - 4 = 4 \\ \lim_{x \rightarrow -2^-} [-4x] + [2x] = [8^-] + [-4^-] = 7 - 4 = 3 \end{cases}$$

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$$\text{الف) } \lim_{x \rightarrow 2} [x^2 - 4x] = [(2)^2 - 4(2)] = [-4] = -4$$

$$\text{ب) } \lim_{x \rightarrow 3} [4x - x^2] = [4(3) - (3)^2] = [9] = 9$$

max پس از 3 پس از 3 $\lim_{x \rightarrow 3} [4] = 4$

$$\text{الف) } \lim_{x \rightarrow 2} \frac{|x - 2|}{x^2 - 3x + 2} \rightarrow \begin{cases} \lim_{x \rightarrow 2^+} \frac{|x - 2|}{x^2 - 3x + 2} = \frac{(x - 2)}{(x - 2)(x - 1)} = 1 \\ \lim_{x \rightarrow 2^-} \frac{|x - 2|}{x^2 - 3x + 2} = \frac{-(x - 2)}{(x - 2)(x - 1)} = -1 \end{cases}$$

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$$\text{ب) } \lim_{x \rightarrow 1} \frac{x - [x]}{x^2 - 1} \rightarrow \begin{cases} \lim_{x \rightarrow 1^+} \frac{x - [x]}{x^2 - 1} = \frac{-1}{0^+} = -\infty \\ \lim_{x \rightarrow 1^-} \frac{x - [x]}{x^2 - 1} = \frac{-1}{0^-} = -\infty \end{cases}$$

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