

(الف) $\lim_{x \rightarrow 3^+} f(x) - 3 = 1 - 3 = \Delta$

$\lim_{x \rightarrow 3^-} f(x) - 3 = 1 - 3 = \Delta$

(الف) $\lim_{x \rightarrow 3^+} f[x] - 3 = 1 - 3 = \Delta$
 $[3^+] = 3$

$\lim_{x \rightarrow 3^-} f[x] - 3 = 1 - 3 = \Delta$
 $[3^-] = 3$

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

$\lim_{x \rightarrow 3^-} [f(x) - 3] = [\Delta] = \Delta$

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

$\left[\lim_{x \rightarrow 3^-} f(x) - 3 \right] = \Delta$

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

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

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

$\lim_{x \rightarrow 3^-} \frac{f(x) - 3}{\sqrt{x^2 - f(x) + 3}} \begin{cases} \frac{9}{\sqrt{0^+}} = +\infty \\ \frac{9}{\sqrt{0^-}} = \cup \bar{\cup} \end{cases}$

(الف) $\lim_{x \rightarrow 3^+} \frac{f(x) - 3}{x^2 - \sqrt{x + 1}} \begin{cases} \frac{9}{0^+} = -\infty \\ \frac{9}{0^+} = +\infty \end{cases}$

$\lim_{x \rightarrow 3^-} \frac{f(x) - 3}{[x - 3]} \begin{cases} \frac{9}{[0^+]} = \frac{9}{0} = \cup \bar{\cup} \\ \frac{9}{[0^-]} = \frac{9}{-1} = -9 \end{cases}$

الف) $\lim_{u \rightarrow 2} [2u] + [-2u]$

$$\begin{array}{l} \nearrow^{2^+} [2^+] + [-2^-] = 2 - 2 = 0 \\ \searrow^{2^-} [2^-] + [-2^+] = 2 - 2 = 0 \end{array}$$

(1)

ب) $\lim_{u \rightarrow -2} [-2u] + [2u]$

$$\begin{array}{l} \nearrow^{-2^+} [+2^+] + [-2^+] = 2 - 2 = 0 \\ \searrow^{-2^-} [2^+] + [-2^-] = 2 - 2 = 0 \end{array}$$

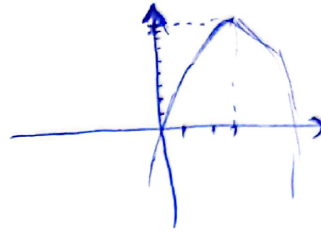
الف) $\lim_{u \rightarrow 2} [u^2 - 2u]$

$$\begin{array}{l} \nearrow^{2^+} [2^+] = 0^- \\ \searrow^{2^-} [2^-] = 0^- \end{array}$$

ب) $\lim_{u \rightarrow 2} [-u^2, 2u]$

$$\begin{array}{l} \nearrow^{2^+} [2^+] = 1 \\ \searrow^{2^-} [2^-] = 1 \end{array}$$

(19)



الف) $\lim_{u \rightarrow 2} \frac{|u-2|}{u^2 - 2u + 2}$

$$\begin{array}{l} \nearrow^{2^+} \frac{|u-2|}{(u-2)(u-1)} = \frac{1}{u-1} = \frac{1}{2-1} = 1 \\ \searrow^{2^-} \frac{-u+2}{(u-2)(u-1)} = \frac{-1}{u-1} = \frac{-1}{1} = -1 \end{array}$$

(1)

ب) $\lim_{u \rightarrow 1} \frac{u - [u]}{u^2 - 1}$

$$\begin{array}{l} \nearrow^{1^+} \frac{u-1}{(u-1)(u+1)} = \frac{1}{u+1} = \left(\frac{1}{2}\right) \\ \searrow^{1^-} \frac{u-0}{(1^-)^2 - 1} = \frac{1}{0^-} = (+\infty) \end{array}$$