

الف)  $\lim_{x \rightarrow 2^+} f(x-3) \Rightarrow a=2 \ y=0 \checkmark$

(۲)

ب)  $\lim_{x \rightarrow 2^-} f(x-3) \Rightarrow a=2 \ y=0 \checkmark$

الف)  $\lim_{x \rightarrow 2^+} f(x) - 3 \Rightarrow f(2^+) - 3 \Rightarrow f(2) - 3 = 0 \checkmark$

(۲)

ب)  $\lim_{x \rightarrow 2^-} f(x) - 3 \Rightarrow f(2^-) - 3 \Rightarrow f - 3 = 1 \checkmark$

۲

الف)  $\lim_{x \rightarrow 2^+} [f(x-3)] \Rightarrow y=0 \checkmark$   
 بلافاصله قرار می‌گیرد  
 $a=2$

(۲)

ب)  $\lim_{x \rightarrow 2^-} [f(x-3)] \Rightarrow y=1 \checkmark$   
 همین زمانه قرار می‌گیرد  
 $a=2$

۲

الف)  $\lim_{x \rightarrow 2^+} [f(x-3)] \Rightarrow [0^+] = 0 \checkmark$

(۲)

ب)  $\lim_{x \rightarrow 2^-} [f(x-3)] \Rightarrow [0^+] = 1 \checkmark$

۲

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

(۲)

ب)  $\lim_{x \rightarrow 3} \frac{f(x-3)}{(x-3)^2} \begin{cases} \rightarrow 3^+ \Rightarrow \frac{0}{0^+} \Rightarrow +\infty \\ \rightarrow 3^- \Rightarrow \frac{0}{0^+} \Rightarrow +\infty \end{cases} \checkmark$   
 جداگانه

۵

الف)  $\lim_{u \rightarrow 3} \frac{u^2 - 3}{u - 3}$   $\Rightarrow \begin{cases} u^+ \Rightarrow \frac{9}{0^+} \Rightarrow +\infty \\ u^- \Rightarrow \frac{9}{0^-} \Rightarrow -\infty \end{cases}$  (2)

ب)  $\lim_{u \rightarrow 3} \frac{u^5 - 3}{\sqrt{u^2 - 8u + 3}}$   $\Rightarrow u^2 - 8u + 3 \Rightarrow (u-3)(u-1) \Rightarrow \frac{u^5 - 3}{(u-3)(u-1)} \Rightarrow \begin{cases} u^+ \Rightarrow \frac{9}{0^+} \Rightarrow +\infty \\ u^- \Rightarrow \frac{9}{0^-} \Rightarrow -\infty \end{cases}$

الف)  $\lim_{u \rightarrow 3} \frac{u^2 - 3}{u^2 - 4u + 1}$   $\Rightarrow \frac{u^2 - 3}{(u-2)(u-1)} \Rightarrow \frac{u^2 - 3}{(u-2)(u-1)} \Rightarrow \begin{cases} u^+ \Rightarrow \frac{9}{0^-} \Rightarrow -\infty \\ u^- \Rightarrow \frac{9}{0^+} \Rightarrow +\infty \end{cases}$  (1, 2, 3)

ب)  $\lim_{u \rightarrow 3} \frac{u^5 - 3}{(u-3)}$   $\Rightarrow \begin{cases} u^+ \Rightarrow \frac{9}{0^+} \Rightarrow \frac{9}{0} = \text{تحت}$  ✓   
  $u^- \Rightarrow \frac{9}{0^-} \Rightarrow \frac{9}{-1} = -9$  ✓

الف)  $\lim_{u \rightarrow 3} [3u] + [-2u]$   $\Rightarrow \begin{cases} u^+ \Rightarrow 9 + (-6) = 3 \\ u^- \Rightarrow 9 + (-6) = 3 \end{cases}$  (2)

ب)  $\lim_{u \rightarrow 4} [-2u^5] + [2u]$   $\Rightarrow \begin{cases} -4^+ \Rightarrow 2^5 - 16 = 11 \\ -4^- \Rightarrow 2^5 - 16 = 11 \end{cases}$  (1)

الف)  $\lim_{u \rightarrow 2} [u^2 - 8]$   $\Rightarrow \begin{cases} u^+ \Rightarrow 4 \\ u^- \Rightarrow 4 \end{cases}$  (2)

ب)  $\lim_{u \rightarrow 3} [9u - u^2]$   $\Rightarrow \begin{cases} u^+ \Rightarrow 1 \\ u^- \Rightarrow 1 \end{cases}$  ✓

الف)  $\lim_{u \rightarrow 2} \frac{|u-2|}{u^2 - 2u + 2}$   $\Rightarrow \begin{cases} u^+ \Rightarrow \frac{u-2}{u^2 - 2u + 2} \Rightarrow \frac{u-2}{(u-2)(u-1)} \Rightarrow \frac{1}{u-1} \Rightarrow u=2 \Rightarrow y=1 \\ u^- \Rightarrow \frac{-(u-2)}{u^2 - 2u + 2} \Rightarrow \frac{-(u-2)}{(u-2)(u-1)} \Rightarrow -\frac{1}{u-1} \Rightarrow u=2 \Rightarrow y=-1 \end{cases}$  (2)

ب)  $\lim_{u \rightarrow 1} \frac{u - [u]}{u^2 - 1}$   $\Rightarrow \begin{cases} 1^+ \Rightarrow \frac{u-1}{u^2-1} \Rightarrow \frac{u-1}{(u-1)(u+1)} \Rightarrow \frac{1}{u+1} \Rightarrow u=1 \Rightarrow y = \frac{1}{2} \\ 1^- \Rightarrow \frac{u}{u^2-1} \Rightarrow u \left( \frac{1}{u} \right) \Rightarrow u^2 > 1 \Rightarrow u=1 \Rightarrow y = \frac{1}{0^+} = +\infty \end{cases}$  ✓

$u \rightarrow 1^- : \frac{u}{(u-1)(u+1)} \Rightarrow \frac{-1}{0^-} \Rightarrow \frac{1}{0^-} = -\infty$