

الف) $\rightarrow \delta \checkmark$ $\leftarrow \rightarrow \delta \checkmark$ (۲) ①

الف) $\rightarrow [x^+] = 2 \Rightarrow f[x^+] = 1 - 3 = -2 = \delta \checkmark$ $\leftarrow [x^-] = 1 \Rightarrow f[x^-] = 1 - 3 = -2 = \delta \checkmark$ (۲) ②

الف) $x > 2 \Rightarrow f(x) > 1 \Rightarrow f(x) - 3 > \delta \Rightarrow [f(x) - 3] = \delta \checkmark$ (۲) ③

ب) $x < 2 \Rightarrow f(x) < 1 \Rightarrow f(x) - 3 < \delta \Rightarrow [f(x) - 3] = \delta \checkmark$ (۲) ④

الف) $\rightarrow \delta$ $\leftarrow \rightarrow \delta$ (۲) ⑤

$\lim_{x \rightarrow 2} f(x) = \delta \checkmark \Rightarrow [\lim_{x \rightarrow 2} (f(x) - 3)] = [\delta] \checkmark$ (۲) ⑥

الف)

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 $\frac{9}{0^+} = +\infty \checkmark$ $\frac{9}{0^-} = -\infty \checkmark$ $\Rightarrow \frac{9}{(0^+)^2} = \frac{9}{0^+} = +\infty \checkmark$ (۲) ⑦

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 $\frac{9}{0^+} = +\infty \checkmark$ $\frac{9}{\sqrt{0^-}} = 0 \checkmark$ $\Rightarrow \frac{f(x) - 3}{\sqrt{(x-1)(x-3)}} \left[\begin{array}{l} + \\ - \end{array} \right] \frac{9}{\sqrt{0^+}} = +\infty \checkmark$ $\frac{9}{\sqrt{0^-}} = 0 \checkmark$ (۲) ⑧

الف) ~~.....~~ $\frac{f(x) - 3}{(x-1)(x-3)} \left[\begin{array}{l} + \\ - \end{array} \right] \frac{9}{0^-} = -\infty \checkmark$ $\frac{9}{0^+} = +\infty \checkmark$ (۲) ⑨

ب)

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 $\frac{9}{[0^+]} = 0 = \frac{9}{0}$ $\frac{9}{[0^-]} = \frac{9}{-1} = -9 \checkmark$

ا) $x > 3 \Rightarrow 3x > 9 \Rightarrow -x < -3 \Rightarrow -2x < -6$
 $\Rightarrow [2x] + [-2x] = 9 - 7 = 2 \checkmark$

(2) (8)

$x < 3 \Rightarrow 3x < 9 \Rightarrow -2x > -6$
 $\Rightarrow [2x] + [-2x] = 8 - 6 = 2 \checkmark$

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ب) $x > -6 \Rightarrow 2x > -12 \Rightarrow -4x < 24$
 $\Rightarrow [2x] + [-4x] = -12 + 24 = 12 \checkmark$

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$x < -6 \Rightarrow 2x < -12 \Rightarrow -4x > 24$
 $\Rightarrow [2x] + [-4x] = -12 + 24 = 12 \checkmark$

(2) (9)

الف)

$x^2 - 4x \xrightarrow{x \neq 2} (x-2)^2 - 4 = x^2 - 4x$

$\Rightarrow [(x-2)^2 - 4] = [x^2 - 4x] \Rightarrow [(x-2)^2] - 4$

$\lim_{x \rightarrow 2} [(x-2)^2] - 4 = [(0^+)^2] - 4 = [0^+] - 4 = -4 \checkmark$

ب) $9x - x^2 = -(x-3)^2 + 9 \Rightarrow \lim_{x \rightarrow 3} [9 - (x-3)^2]$
 $= [9 - (0^+)^2] = [9 - 0^+] = [9^-] = 9 \checkmark$

ا) $\frac{-1}{x-1}$

$\frac{-1}{x-1} \xrightarrow{x \rightarrow 1^-} -1 \checkmark$
 $\frac{1}{x-1} \xrightarrow{x \rightarrow 1^+} 1 \checkmark$

ب) $\frac{0^+}{(1^+-1)(1^++1)} = \frac{0^+}{(0^+)(2^+)}$
 $\frac{1^-}{(0^-)(2^-)} = +\infty \checkmark$

(2) (10)