«ستوده مداری» شماره تکلیف ۲۹ «یازدهم دختر B»

1

ب) $\lim_{x \to 2^-} f_{x-2}$ ⇒ الف) $\lim_{x \to 2^+} f_{x-2}$

$\lim_{x \to 2^+} f(2^+) - 2 = 8^+ - 2 = 6^+ = \boxed{6}$ $\lim_{x \to 2^-} f(2^-) - 2 = 8^- - 2 = 6^- = \boxed{6}$

2

ب) $\lim_{x \to 2^-} f[x] - 2$ الف) $\lim_{x \to 2^+} f[x] - 2$

$\lim_{x \to 2^+} f[2,0] - 2 = f(2) - 2 = \boxed{6}$ $\lim_{x \to 2^-} f[1,9] - 2 = 4 - 2 = \boxed{1}$

3

ب) $\lim_{x \to 2^-} [f_{x-2}]$ الف) $\lim_{x \to 2^+} [f_{x-2}]$

$\lim_{x \to 2^+} [f(2^+) - 2] = [8^+ - 2]$ $\lim_{x \to 2^-} [f(2)^- - 2] = [8^- - 2]$

$\lim_{x \to 2^+} [6^+] = \boxed{6}$ $\lim_{x \to 2^-} [6^-] = \boxed{4}$

4

ب) $[\lim_{x \to 2^-} f_{x-2}]$ الف) $[\lim_{x \to 2^+} f_{x-2}]$

$[\lim_{x \to 2^+} f_{x-2}] = [f(2^+) - 2] = \boxed{6}$ $[\lim_{x \to 2^-} f_{x-2}] = [f(2^-) - 2] = \boxed{6}$

5

ب) $\lim_{x \to 2^-} \frac{f_{x-2}}{(x-2)^2} = \frac{9}{(0^-)^2}$ (حد ندارد) الف) $\lim_{x \to 2^+} \frac{f_{x-2}}{x-2} = \frac{9}{0^+}$ (حد ندارد)

$\lim_{x \to 2^+} \frac{f_{x-2}}{(x-2)^2} = \frac{9}{(0^+)^2} = \boxed{+\infty}$ $\lim_{x \to 2^+} \frac{f_{x-2}}{x-2} = \frac{9}{0^+} = \boxed{+\infty}$

$\lim_{x \to 2^-} \frac{f_{x-2}}{(x-2)^2} = \frac{9}{(0^-)^2} = \boxed{+\infty}$ $\lim_{x \to 2^-} \frac{f_{x-2}}{x-2} = \frac{9}{0^-} = \boxed{-\infty}$

الف) $\lim_{x\to 3} \frac{4x-3}{\sqrt{x-2}} = \frac{9}{\sqrt{0^+}}$ (مخرج مثبت میشود)

$= \frac{9}{0^+} = +\infty$

ب) $\lim_{x\to 3} \frac{4x-3}{\sqrt{x^2-4x+4}} = \frac{4x-3}{\sqrt{(x-2)(x-2)}} = \frac{9}{\sqrt{0^+}}$

$+\infty$ | 2 | 3 | $+\infty$

$+0$ | $-$ | 0^+

$= \frac{9}{0^+} = +\infty$ **6**

$\lim_{x\to 2^+} \frac{4x-3}{\sqrt{x-2}} = \frac{9}{\sqrt{0^+}} = +\infty$

$\lim_{x\to 3^+} \frac{4x-3}{\sqrt{x^2-4x+4}} = \frac{9}{\sqrt{0^+}} = +\infty$

$\lim_{x\to 2^-} \frac{4x-3}{\sqrt{x-2}} = \frac{9}{\sqrt{0^-}} = -\infty$

$\lim_{x\to 3^-} \frac{4x-3}{\sqrt{x^2-4x+4}} = \frac{9}{\sqrt{0^-}} = -\infty$

الف) $\lim_{x\to 3} \frac{4x-3}{x^2-7x+12} \Rightarrow \frac{4x-3}{(x-3)(x-4)} = \frac{9}{0^-}$ (حد ندارد)

ب) $\lim_{x\to 3} \frac{4x-3}{[x-4]} \Rightarrow$ دارای وضعیت عدمی (حد ندارد)

3 | 4

$+0$ | $-$ | 0^+

$\lim_{x\to 3^+} \frac{4x-3}{x^2-7x+12} = \frac{9}{0^-} = -\infty$ **7**

$\lim_{x\to 4^+} \frac{4x-3}{[x-4]} = \frac{9}{0^+} = +\infty$

$\lim_{x\to 3^-} \frac{4x-3}{x^2-7x+12} = \frac{9}{0^+} = +\infty$

$\lim_{x\to 4^-} \frac{4x-3}{[x-4]} = \frac{9}{-1} = -9$

الف) $\lim_{x\to 3} [2x] + [-2x]$ (حد ندارد) دارای وضعیت عدمی

$\lim_{x\to 3^+} [2x] + [-2x] \Rightarrow x > 3 \Rightarrow 2x > 6 \Rightarrow -2x < -6$

$\Rightarrow [9,\omega] + [-9,\omega] = 9 - 10 = -1$

$\lim_{x\to 3^-} [2x] + [-2x] \Rightarrow x < 3 \Rightarrow 2x < 6 \Rightarrow -2x > -6$

$\Rightarrow [8,\omega] + [-5,\omega] = 8 - 9 = -1$

ب) $\lim_{x\to -3} [-4x] + [2x]$ (حد ندارد)

$\lim_{x\to -3^+} [-4x] + [2x] \Rightarrow x > -3 \Rightarrow 2x > -6 \Rightarrow -4x < 12$

$[12,\omega] + [-11,\omega] = 23 - 12 = 11$ **8**

$\lim_{x\to -3^-} [-4x] + [2x] \Rightarrow x < -3 \Rightarrow 2x < -6 \Rightarrow -4x > 12$

$[12,\omega] + [-13,\omega] = 24 - 13 = 11$

الف) $\lim_{x\to 2} [x^2 - 4x]$ (حد ندارد)

$\lim_{x\to 2^+} [x^2-4x] \Rightarrow [x(x-4)] = [2,1(2,1-4)]$

$= [-3,99] = -4$

$\lim_{x\to 2^-} [x^2-4x] \Rightarrow [x(x-4)] = [1,9(1,9-4)]$

$= [-3,99] = -4$

ب) $\lim_{x\to 2} [9x - x^3]$ (حد دارد)

$\lim_{x\to 2^+} [9x-x^3] = \lim_{x\to 2^-} [9x-x^3]$

$\lim_{x\to 2^+} [9x-x^3] = [x(9-x)] = [2,1(9-2,1)]$

$= [18,99] = 18$ **9**

$\lim_{x\to 2^-} [9x-x^3] = [x(9-x)] = [2,9(9-2,9)]$

$= [18,99] = 18$

الف) $\lim_{x\to 2} \frac{|x-2|}{x^2-3x+2}$ (حد ندارد) مخرج صفر میشود.

$\lim_{x\to 2^+} \frac{|x-2|}{(x-2)(x-1)}$

$\lim_{x\to 2^-} \frac{|x-2|}{(x-2)(x-1)}$

$\lim_{x\to 2^+} \frac{(x-2)}{(x-2)(x-1)} = \frac{1}{x-1} = \frac{1}{2-1} = 1$

$\lim_{x\to 2^-} \frac{-(x-2)}{(x-2)(x-1)} = \frac{-1}{x-1} = \frac{-1}{2-1} = -1$

ب) $\lim_{x\to 1} \frac{x-[x]}{x^2-1}$ (حد ندارد) مخرج صفر میشود.

$\lim_{x\to 1^+} \frac{x-1}{(x-1)(x+1)} = \frac{1}{x+1} = \frac{1}{2}$ **10**

$\lim_{x\to 1^-} \frac{x-0}{(x-1)(x+1)} = \frac{1}{0^-} = -\infty$