(سارا امینی راد)

①

$f(x) = (x+1)^2 + (3x-1)^2 + mx^2 + nx + mn$

$\hookrightarrow x^2 + 2x + 1 + 9x^2 - 6x + 1 + mx^2 + nx + mn \rightarrow (10+m)x^2 + (-4+n)x + 2 + \overset{-40}{mn} \rightarrow f(x) = -38$

$\hookrightarrow m = -10 \qquad \hookrightarrow n = 4$

چون ۲ تابع ثابت است $\rightarrow$ ضریب x $\rightarrow$ صفر

$g(x) = \{(4, m)(n; \overset{-10}{p+1})(p+2, -1)(-9, p+k)\} \rightarrow -10 + 4 - 11 + 10 = -7$

$p = -11$

$\hookrightarrow (4, -10)(4, -10)(-9, -1)(-9, \underbrace{-11+k}_{-1})\} \rightarrow k = 10$

② الف)

$\sqrt{\dfrac{x-2}{x^4 - 2x^2 - 8}}$

$D_f = (-2, +\infty) - \{2\}$

$x^2 = t \qquad t^2 - 2t - 8$

$\hookrightarrow (t-4)(t+2)$

$x^2 = 4 \qquad x^2 = -2$ غق

$\hookrightarrow x = \pm 2$

ب)

$\dfrac{2x^2+1}{4 - 2[-x]} \rightarrow 4 - 2[-x] \neq 0 \rightarrow 4 \neq 2[-x] \rightarrow 2 \neq [-x] \rightarrow x \neq [-3, -1)$

③ الف)

$f(x) = \dfrac{\sqrt{x(x^2-1)}}{\sqrt{|x| + x}}$

$\rightarrow x(x^2-1) \geq 0 \qquad -1 \quad 0 \quad 1 \rightarrow [-1, 0] \cup [1, +\infty)$

$\rightarrow |x| + x > 0 \rightarrow x > 0 \rightarrow 2x > 0 \Rightarrow x > 0$

$\hookrightarrow x < 0 \rightarrow -x + x = 0$ ✗

$\cap \Rightarrow D_f = [1, +\infty)$

ب)

$f(x) = \dfrac{\sqrt{|x-2| - x^2}}{|x| - 1} \rightarrow |x-2| - x^2 \geq 0$

$x \geq 2 \qquad x - 2 - x^2 \geq 0 \rightarrow 1 - 4(-2)(-1) = 1 - 8 \rightarrow \Delta < 0, \ a < 0$ همواره منفی ⓪

$x < 2$ ① $\rightarrow -x^2 - x + 2 \geq 0 \rightarrow -(x^2 + x - 2)$

$-(x+2)(x-1)$

$-2 \quad 1$ ① ∩ ②

$\hookrightarrow [-2, 1]$

$\rightarrow |x| - 1 \neq 0 \rightarrow |x| \neq 1 \rightarrow x \neq -1, 1$

$D_f = [-2, 1] - \{-1, 1\}$

④

$\dfrac{1}{||x-2|-1| - k} \rightarrow ||x-2|-1| - k = 0 \rightarrow ||x-2|-1| = k \rightarrow |x-2| - 1 = k$

$\hookrightarrow |x-2| - 1 = -k$

$|x-2| = k+1 \rightarrow x - 2 = k+1 \rightarrow x = k+3$

$\hookrightarrow x - 2 = -k - 1 \rightarrow x = -k + 1$

$k + 3 = -k + 1 \rightarrow 2k = -2 \rightarrow k = -1$

اگر $k = -1 \rightarrow x = \{0, 2, 4\}$

$k = 1 \rightarrow x = \{0, 2, 4\}$

$|x - 2| = -k + 1$

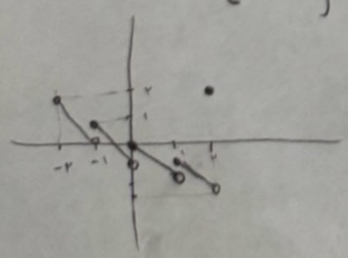
$\hookrightarrow x - 2 = -k + 1 \rightarrow x = -k + 3$

$x - 2 = k - 1 \rightarrow x = k + 1$

$-k + 3 = k + 1$

$k = 1$

⑤



	شروع	پایان
$[-2, -1)$	$(-2, 2)$	$(-1, 0)$
$[-1, 0)$	$(-1, 1)$	$(0, -1)$
$[0, 1)$	$(0, 0)$	$(1, -2)$
$[1, 2)$	$(1, -1)$	$(2, -3)$

(با راهنمایی راد)

(۱۰)

$y = (-1)^{x}(x - [x]) = \frac{1}{2} \rightsquigarrow (x - [x]) = \frac{1}{2} \rightarrow x - [x] = \frac{1}{2}$

$x = \{-1,5, -0,5, 0,5, 1,5\}$