

$$f(x) = (x+1)^2 + (3x-1)^2 + mx^2 + nx + mn \Rightarrow x^2 + 2x + 1 + 9x^2 - 6x + 1 + mx^2 + nx + mn$$

$$(m+10)x^2 + (n-4)x + mn+2 \Rightarrow m = -10, n = 4$$

$$g(x) = \left\{ (4, m), (n, p+1), (p+2, -1), (-9, p+k) \right\} \Rightarrow p+1 = -1 \Rightarrow p = -2$$

$$K_n = 10 \Rightarrow m+n+p+k = 4-10-2 = -8$$

$$الف) \sqrt{\frac{x-2}{x^2-2x-1}} \Rightarrow \sqrt{\frac{x-2}{(x^2-4)(x^2+1)}} \Rightarrow \sqrt{\frac{-2}{-4} + \frac{1}{1} + \frac{1}{1}} \Rightarrow D_f = (-2, +\infty) - \{2\}$$

ب) $f(x) = \frac{2x^2+1}{x-2[-x]} \Rightarrow x-2[-x] \neq 0 \Rightarrow x \neq 2[-x] \Rightarrow x \neq -2x$

$$\Rightarrow x \neq -x \Rightarrow x \neq 0 \Rightarrow D_f = \mathbb{R} - \{0\}$$

$$f(x) = \frac{\sqrt{x(x^2-1)}}{\sqrt{|x|+x}} \Rightarrow \textcircled{I} x+|x| > 0 \Rightarrow (0, +\infty), x \neq 0$$

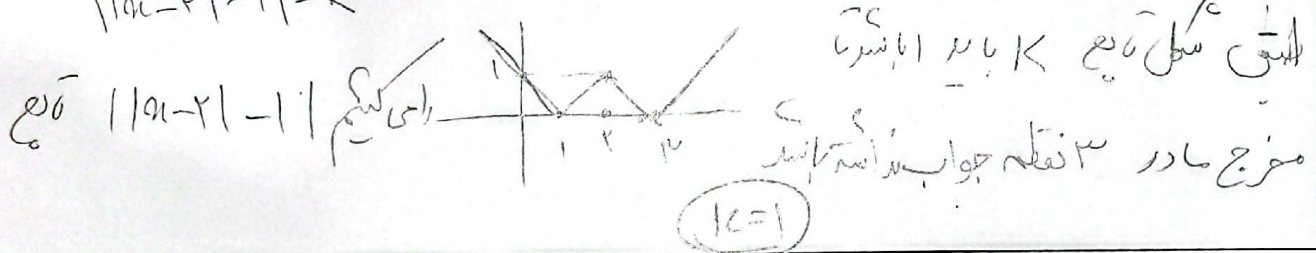
$$\textcircled{II} x(x^2-1) \geq 0 \Rightarrow \frac{-1 \pm \sqrt{1-4}}{2} \Rightarrow [-1, 0] \cup [1, +\infty)$$

$$\textcircled{I} \cap \textcircled{II} = [1, +\infty)$$

ب) $\sqrt{\frac{|x-2|-x^2}{|x|-1}} \Rightarrow \textcircled{II} |x-2|-x^2 \geq 0 \Rightarrow \begin{cases} x^2-x+2 \leq 0 \rightarrow \text{همواره مثبت است} \\ x^2+x-2 \leq 0 \rightarrow \frac{-1 \pm \sqrt{1-4}}{2} \end{cases}$

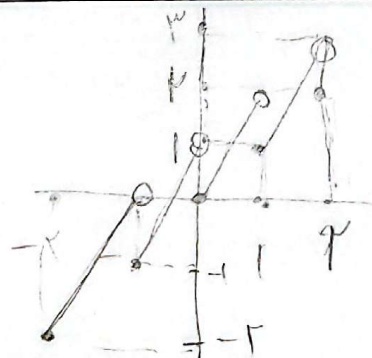
$$\textcircled{I} \Rightarrow |x| \neq 1 \Rightarrow x \neq \pm 1 \Rightarrow D_f = [-2, -1] \cup (-1, 1)$$

$$y = \frac{1}{||x-2|-1|-k} \Rightarrow ||x-2|-1|-k \rightarrow \text{جواب ۳}$$



$$y = 2x - [x] \Rightarrow [-2, -1] \Rightarrow 2x$$

$$(-1, 0) \Rightarrow 2x+1$$



$$f(x) = \frac{x^r - rx + r^2}{x+a} + b \Rightarrow \frac{x^r + (b-r)x + r^2 + ab}{x+a} \quad \left| \begin{array}{l} x+a \\ x- \\ (b+r) \end{array} \right|$$

$$\Rightarrow x - (b+r+a) \Rightarrow x - (a-b+r) = x$$

$$\Rightarrow a-b+r=0 \Rightarrow \boxed{a-b=-r}$$

$$f(x) = \begin{cases} \frac{x^r + rx^r - x - r}{x^r - 1} ; x \neq \pm 1 \Rightarrow x=0 \Rightarrow f(0)=r \\ \frac{ax+r}{x+b} ; x = \pm 1 \end{cases} \Rightarrow g(0)=c \Rightarrow \boxed{c=2}$$

$$g(x) = x+c \quad \left\{ \begin{array}{l} C+b=r+\frac{1}{2} \\ \neq \frac{2}{r} \end{array} \right. \quad \left\{ \begin{array}{l} x=1 \Rightarrow \frac{a+r}{1+b}=r \Rightarrow a+r=b+r \Rightarrow b=a \\ x=-1 \Rightarrow \frac{-a+r}{b-1}=1 \Rightarrow b-1=r-a \Rightarrow b=\frac{1}{r} \end{array} \right.$$

$$f(x) = \sqrt{rx - ra} + k - 1 \Rightarrow f - g = \{(1, k)\}$$

$$g(x) = \sqrt{b - rx} + rk$$

$$\Rightarrow r\sqrt{r-ra} + rk - 1 - \sqrt{b-r} - rk = k \Rightarrow rk = -r \Rightarrow \boxed{k=-1}$$

$$f(x) = \sqrt{m-x} + n \Rightarrow f(x) = \sqrt{v-m+x} \quad f-g(x) = 4\sqrt{r} \Rightarrow n = \pm r + \lambda\sqrt{r}$$

$$g(x) = \sqrt{rx+r} \Rightarrow D_g = [-1, +\infty)$$

$$D_{f \times g} = [-1, v] \Rightarrow D_f = (-\infty, 7]$$

$$\Rightarrow m+n = 5 + \lambda\sqrt{r}$$

$$y = (-1)^r (x - [x]) \Rightarrow x - [x]$$

$$y = \frac{1}{2} \Rightarrow \text{جواب } r$$

