

$$f(u) = (u+1)^2 + (3u-1)^2 + mu^2 + nu + m \rightarrow y = -31$$

$$u^2 + 2u + 1 + 9u^2 - 6u + 1 \Rightarrow 10u^2 - 4u + 2 \Rightarrow m = -10, n = 2$$

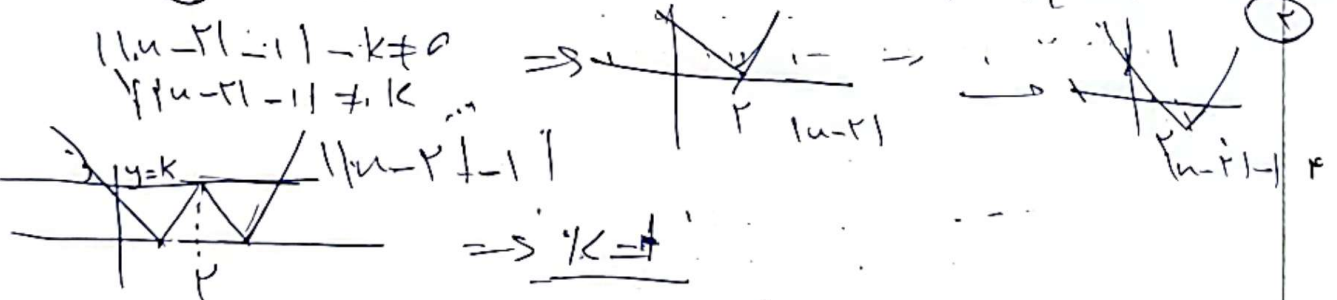
$$g(u) = f\left(\frac{-10}{2}, \frac{2}{2}, -9\right) = f(-5, 1, -9) = 10 - 11 + 10 + 2 = -1$$

$$y = \sqrt{\frac{u-2}{u^2-4u-1}} \Rightarrow \sqrt{\frac{u-2}{(u^2-4u-1)(u^2+21)}} \quad \begin{array}{c} -2 \quad 21 \\ \hline - \quad + \quad + \end{array}$$

$$D_y = (-2, +\infty) \cup (-2, 21) \quad \rightarrow \frac{2u^2+1}{2-4u} = 2-4u \neq 0 \Rightarrow 2 \neq 4u \quad [u] \neq \frac{1}{2} \Rightarrow K = \left(-\frac{1}{2}, \frac{1}{2}\right)$$

$$f(u) = \sqrt{u(u^2-1)} \quad \begin{array}{c} -1 \quad 0 \quad 1 \\ \hline - \quad + \quad - \end{array} \quad \begin{array}{l} |u|+u > 0 \\ u \in \mathbb{R}^+ \end{array}$$

$$\sqrt{|u|-1} \rightarrow |u|-1 \geq 0 \quad u-2 \geq u^2 \Rightarrow u^2 - u + 2 \leq 0 \Rightarrow \Delta = 1 - 8 < 0 \quad \text{no solution}$$

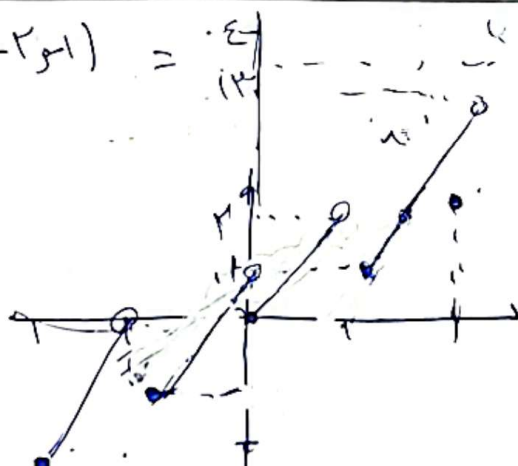


$$y = 2u - [u] \Rightarrow D = [-2, 1) = \{x \mid -2 \leq x < 1\}$$

$$D = [-1, 0] = 2u + 1$$

$$D = (0, 1) = 2u$$

$$D = [1, 2) = 2u - 1$$



$$f(u) = \frac{u^2 - 5u + 3}{u+a} + b \Rightarrow \frac{(u-3)(u-1)}{u+a} + b$$

$\Rightarrow \text{داده} \Rightarrow a = -1 \quad \text{یا} \quad a = -3 \Rightarrow \text{اگر } a = -3 \Rightarrow u-1+b = u \Rightarrow b=1$   
 اگر  $a = -1 \Rightarrow u-3+b = u \Rightarrow b=3 \Rightarrow a-b = -4 \Rightarrow \dots$

$$f(u) = \frac{u^2(u+2) - 1(u+2)}{(u^2-1)} \Rightarrow \frac{u^2-1}{u^2-1} \cdot \frac{(u+2)}{1} \quad \begin{matrix} u+2=3 \Rightarrow 1=1 \\ 1=1 \end{matrix}$$

$\frac{1}{2} + a = \frac{11}{2} \Rightarrow a = 5$   
 $a-3b=1$   
 $a+b=3$   
 $-4b=-2 \Rightarrow b=\frac{1}{2} \Rightarrow a=\frac{7}{2}$   
 $a-3b=1$   
 $a+2=3+3b$   
 $\frac{2-a}{b-1} = +1$   
 $2-a=b-1$

از این دو معادله می توانیم بدست آوریم که  $a=5$  و  $b=\frac{1}{2}$

$$f(u) = \sqrt{\frac{5}{2}u - 3a} + k - 1 \quad g(u) = \sqrt{b - \frac{5}{2}u} + 2k$$

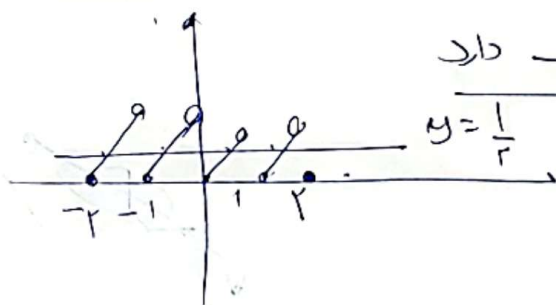
$\frac{5}{2}u - 3a = -b + \frac{5}{2}u \quad 3a = b$   
 $a = \frac{5}{3}, b = \frac{5}{3}$   
 $2k - 1 + 3k = k \Rightarrow 5k = 1 \Rightarrow k = \frac{1}{5}$

$$f(u) = \sqrt{m-u} + n \quad g(u) = \sqrt{2u+2}$$

$m-u \leq 0 \Rightarrow m=0$   
 $2u+2 \geq 0 \Rightarrow u \geq -1$   
 $\sqrt{\frac{5}{2}u} + n - 2\sqrt{2} = 4\sqrt{2}$   
 $n = 1\sqrt{2} \Rightarrow m+n = 0 + 1\sqrt{2}$

$$|u - [u]| = \frac{1}{2}$$

در اینجا می بینیم که



در اینجا می بینیم که

$$y = \frac{1}{2}$$