

تابع هست $y_1 = y_2 \Rightarrow y_1^2 = y_2^2 \Rightarrow y_1^2 = 2x^2 + 2x - 1 \Rightarrow y_1^2 = 2x^2 + 2x - 1$ و $y_2^2 = 2x^2 + 2x - 1 \Rightarrow y_1^2 = y_2^2 \Rightarrow y_1 = y_2$ (اف)

تابع نیست $\frac{2x}{\cos x} = \frac{y}{\cos y} \Rightarrow x = \frac{\pi}{2} \rightarrow y = \left(\frac{\pi}{2} + \frac{\pi}{2} \right)$

تابع هست $\frac{x^2 y^2 + 2xy}{3} = xy \Rightarrow x^2 + y^2 - 4xy = 0 \Rightarrow (x-y)^2 = 0 \Rightarrow x = y$

تابع هست $x(y^2 + 2) - y(y^2 + 2) \Rightarrow (y^2 + 2)(x - y) = 0 \Rightarrow y = x$

$|x-1| > 2 \Rightarrow \begin{cases} x-1 \geq 2 \Rightarrow x \geq 3 \\ x-1 \leq -2 \Rightarrow x \leq -1 \end{cases} \Rightarrow f(x) = \begin{cases} 2x^2 - b & |x-1| \geq 2 \\ a + 2x & -3 \leq x \leq -1 \end{cases}$

$\Rightarrow 1-b = a-2 \Rightarrow a+b = 3$ (مشتتر در $x=1$ باز)

$-x^2 - bx + a \geq 0 \Rightarrow \frac{b}{2} \quad a \Rightarrow m(x-b)(x-a) \Rightarrow m(x^2 - (a+b)x + ab)$

$\Rightarrow -x^2 + (a+b)x - ab \Rightarrow ab = a \Rightarrow \boxed{b = -1}$

$a+b = -b \Rightarrow a = -2b \Rightarrow \boxed{a = 2} \Rightarrow a+b = 2+(-1) = 1$

$ax^2 + bx + c \Rightarrow \text{بازگشایی} \Rightarrow (a=0) \Rightarrow \sqrt{bx+c} \Rightarrow bx+c \geq 0$

$bx \geq -c \Rightarrow x \leq \frac{-c}{b} \Rightarrow \frac{-c}{b} = 2 \Rightarrow -c = 2b \Rightarrow c = -2b$

$2a + (-3|b|) = 0 + (-2b) - 3(-b) = -2b + 3b = \boxed{b}$

اف) $|x| - [x] \neq 0 \Rightarrow |x| \neq [x] \Rightarrow (x \neq \mathbb{Z}^+ \cup \mathbb{Z}^-)$

$\Rightarrow Df = \mathbb{R} - (\mathbb{Z}^+ \cup \mathbb{Z}^-)$

ب) $\textcircled{1} \rightarrow x \geq 0 \quad \textcircled{2} \rightarrow \sqrt{y} = 9 - \sqrt{x} \Rightarrow 9 - \sqrt{x} \geq 0 \Rightarrow x \leq 81$

$\Rightarrow Df = [0, 81)$

الف) ① $2x-1 > 0 \Rightarrow x > \frac{1}{2}$ ② $x > 0$ ③ $\log_x^{2x-1} \geq 0 \Rightarrow 2x-1 \geq 1$
 $\Rightarrow x \geq \frac{3}{2} \Rightarrow ① \cap ② \cap ③ \Rightarrow D = [\frac{3}{2}, +\infty) - \{1\}$

ب) $\frac{1}{\sqrt{x+1}-|x|} > 0 \Rightarrow \sqrt{x+1}-|x| > 0 \Rightarrow \sqrt{x+1} > |x| - 1 \Rightarrow$
 $\Rightarrow \sqrt{x+1} = |x| - 1 \Rightarrow x^2 + 1 = (|x| - 1)^2 \Rightarrow x^2 + 1 = x^2 - 2|x| + 1 \Rightarrow -2|x| = 0 \Rightarrow |x| = 0 \Rightarrow x = 0$
 $\Rightarrow D_f = (-1, 1)$

$\Rightarrow b = -2 \Rightarrow f(x) = \sqrt{\frac{x+3}{x-2}}$ $\Rightarrow y(x) \Rightarrow$

$\Rightarrow y \in \mathbb{R} \Rightarrow a = -3$

$\Rightarrow f(x) = \sqrt{\frac{x+3}{x-2}} = \sqrt{\frac{\Delta}{x-2}} \quad \begin{matrix} b = -2 \\ a = 3 \end{matrix}$

$f(x) - x + 1 \geq 0 \Rightarrow f(x) \geq x - 1 \Rightarrow f(x) \begin{cases} 2x-1 & ; x \geq 0 \\ x+3 & ; x < 0 \end{cases}$

① $2x-1 \geq x-1 \quad (x \geq 0) \Rightarrow x \geq 0 \Rightarrow x \geq 0$

② $x+3 \geq x-1 \quad (x < 0) \Rightarrow x \geq -4 \Rightarrow x \geq -\frac{4}{3} \Rightarrow x < 0$

① $\cup$ ② $\Rightarrow D_g = [-\frac{4}{3}, +\infty) - \{0\}$

$\frac{(18x^2 + 12x + 4x + 1)}{(2x+1)^2} = \frac{3(2x+1)^2}{(2x+1)^2} = \frac{3}{2x+1} \Rightarrow 2x+1 \neq 0 \Rightarrow x \neq -\frac{1}{2}$

$\Rightarrow D_f = \mathbb{R} - \{-\frac{1}{2}\}$

① $2x-a > 0 \Rightarrow x > \frac{a}{2}$

② $1 - \log(2x-a) \geq 0 \Rightarrow \log(2x-a) \leq 1 \Rightarrow 2x-a \leq 10 \Rightarrow x \leq 5 + \frac{a}{2}$

$(b, c] \Rightarrow (\frac{a}{2}, 5 + \frac{a}{2}] \Rightarrow c - b = 5 + \frac{a}{2} - \frac{a}{2} = 5$