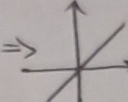


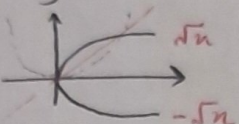
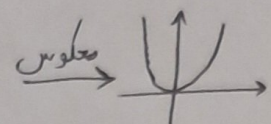
الف)  $y^3 - 2y^2 = 2y - 1 \rightarrow y^3 = 2y^2 + 2y - 1 \rightarrow y = \sqrt[3]{2y^2 + 2y - 1} \Rightarrow$  تابع هست

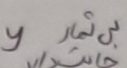
ب)  $x \cos y = y \cos x \xrightarrow{\text{مثال نقی}} x = \frac{\pi}{2} \rightarrow \cos y = 0 \Rightarrow$  حالت دارد  $\Rightarrow$  تابع نیست

ج)  $x + y = 2\sqrt{xy} \xrightarrow{\text{چون } x=y} x + y - 2\sqrt{xy} = 0 \rightarrow (\sqrt{x} - \sqrt{y})^2 = 0 \rightarrow \sqrt{x} - \sqrt{y} = 0 \Rightarrow x = y \rightarrow$   تابع هست

د)  $x(y^2 + 2) - y(y^2 + 2) = (y^2 + 2)(x - y) = 0 \xrightarrow{x=y} y^2 + 2 = 0 \Rightarrow$    $\Rightarrow$  تابع هست

الف)  $|y| + x^2 = 2y \xrightarrow{\text{معکوس}} |x| + y^2 = 2x \rightarrow y^2 = 2x - |x| \rightarrow y = \pm \sqrt{2x - |x|} \xrightarrow{\text{تعیین علامت}} \begin{matrix} x > 0 & y = \pm \sqrt{x} \\ x < 0 & y = \pm \sqrt{-x} \end{matrix}$

$\rightarrow$    $\rightarrow$    $\rightarrow$  تابع هست

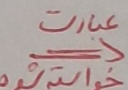
ب)  $[y] + [x] = 1 \xrightarrow{\text{مثال نقی}} x = 0 \rightarrow [y] = 1 \rightarrow 1 \leq y < 2 \rightarrow y$    $\Rightarrow$  تابع نیست

$f(n) = \begin{cases} 2n^2 - b & |n-1| \geq 2 \\ a + 2n & 0 \leq n \leq 3 \end{cases} \xrightarrow{|n-1| \geq 2} n-1 \geq 2 \vee n-1 \leq -2 \rightarrow n \geq 3 \vee n \leq -1$   
 $\Rightarrow n=3 \rightarrow 2n^2 - b = a + 2n \rightarrow 18 - b = a + 6 \rightarrow a + b = 12$

$f(n) = \sqrt{-(n^2 + bn - a)} \xrightarrow{\text{تعیین علامت طبق بازه ها}} -\frac{1}{b} + \frac{1}{a} = \frac{n-a}{n-b} \xrightarrow{n=a} a^2 + ab - a = 0 \star$   
 $\xrightarrow{n=b} b^2 + b^2 - a = 0$

$\Rightarrow a(a+b-1) = 0 \xrightarrow{a \neq 0} a+b-1 = 0 \rightarrow a+b = 1$

$\rightarrow (-\infty, a) \cup (c, +\infty)$  بود  $\Rightarrow$  معادله ای یک خط در خروجی است  $\Rightarrow a = 9$   
 چون دامنه از  $-\infty$  شروع شده  $\Rightarrow b < 0$

$\Rightarrow bn + c > 0 \rightarrow n < -\frac{c}{b} \Rightarrow -\frac{c}{b} = 2 \rightarrow +c = -2b$    $\Rightarrow 3a + c - 3|b| = -2b - (-3b) = b$

$y = \sqrt{\frac{2n+2}{n+b} + a} = \sqrt{\frac{2n+2+a(n+b)}{n+b}} = \sqrt{\frac{x(3+a) + (2+ab)}{n+b}} \xrightarrow{\text{چون دامنه نقطه یک اینجاست که در خروجی است}} 3+a = 0 \rightarrow a = -3$

$4b = 0 \rightarrow b = -2$

الف)  $y = \sqrt[3]{2x^2 - x} \rightarrow x^3 - x \geq 0 \rightarrow x(x-1)(x+1) \geq 0 \rightarrow \frac{1}{x-1} + \frac{1}{x} - \frac{1}{x+1} \Rightarrow D_{(f)} = [-1, 0] \cup [1, +\infty)$

ب)  $y = \frac{1}{\sqrt{|x|-1}} \rightarrow |x|-1 > 0 \rightarrow |x| > 1 \Rightarrow \begin{matrix} x > 1 \\ x < -1 \end{matrix} \Rightarrow (-\infty, -1) \cup (1, +\infty)$

الف)  $y = \sqrt[3]{\frac{1}{|x| - [x]}} \rightarrow |x| - [x] \neq 0 \rightarrow [x] \neq |x| \xrightarrow{\text{می دانیم } [x] \leq x \text{ و } x \in \mathbb{Z} \rightarrow [x] = |x|}$

$\Rightarrow D_{(f)} = \mathbb{R} - \{x | x \in \mathbb{Z} \text{ و } x \geq 0\}$

ب)  $\sqrt{x} + \sqrt{y} = 9 \rightarrow \sqrt{y} = 9 - \sqrt{x} \xrightarrow{x \geq 0} 9 - \sqrt{x} \geq 0 \rightarrow 9 \geq \sqrt{x} \rightarrow 81 \geq x \geq 0 \Rightarrow D_{(f)} = [0, 81]$

$[2n - \frac{1}{2}] + [2n + \frac{3}{2}] > 0 \rightarrow [2n - \frac{1}{2} + 1 - 2] + [2n + \frac{3}{2}] = 2[2n + \frac{3}{2}] - 2 > 0 \rightarrow [2n + \frac{3}{2}] > 1$   
 $\rightarrow 2 \leq 2n + \frac{3}{2} \rightarrow \frac{1}{2} \leq 2n \rightarrow \frac{1}{4} \leq n \rightarrow D_{(f)} = [\frac{1}{4}, +\infty)$

$2n - a > 0$  و  $1 - \log(e^{2n-a}) > 0 \Rightarrow D_{(f)} = (\frac{a}{2}, \frac{a+b}{2}] \Rightarrow c-b = \frac{10+a}{2} - \frac{a}{2} = \frac{10}{2} = 5$