

الف) $y' = 2x^r + 2n - 1 \rightarrow \begin{cases} y_1' = 2x_1^r + 2n_1 - 1 & n_1 = n_2 \\ y_2' = 2x_2^r + 2n_2 - 1 \end{cases} \quad y_1' = y_2' \rightarrow y_1 = y_2$ تابع هست ✓

ب) $n \cos y = y \cos n \xrightarrow{n=\frac{\pi}{2}} \frac{\pi}{2} \cos y = y \cos \frac{\pi}{2} \rightarrow \cos y = 0$ به ازای $y = \frac{\pi}{2}$ ✓ تابع نیست ✓

ج) $\frac{n+y}{2} = \sqrt{ny} \rightarrow \frac{n^2+y^2+2ny}{2} = ny \rightarrow n^2 - 2ny + y^2 = 0 \rightarrow (n-y)^2 = 0 \rightarrow n=y$ ✓ تابع هست ✓

د) $n(y^r+1) - y(y^r+1) = 0 \rightarrow (y^r+1)(n-y) = 0 \xrightarrow{y^r+1 \neq 0} n=y$ ✓ تابع هست ✓

هـ) $|x| + x^2 = 2y \rightarrow 2y > 0 \rightarrow y > 0 \rightarrow y + x^2 = 2y \rightarrow x^2 = y$ ✓ تابع هست ✓

و) $[y] + [x] = 1 \xrightarrow{x=0} [y] + 0 = 1 \rightarrow [y] = 1 \rightarrow y = [1, 2)$ ✓ تابع نیست ✓

$|n-1| \geq 2 \rightarrow \begin{cases} n-1 \geq 2 \rightarrow n \geq 3 \\ n-1 \leq -2 \rightarrow n \leq -1 \end{cases} \rightarrow f(n) = \begin{cases} 2n^2 - b & n \geq 3 \\ a + 2n & -1 \leq n < 3 \\ 2n^2 - b & n \leq -1 \end{cases}$

$n=3 \rightarrow 2n^2 - b = a + 2n \rightarrow a + b = 2n^2 - 2n = 12$ ✓

$f(n) = \sqrt{-n^2 - bn + a} \rightarrow Df = [b, a]$ a و b ریشه عبارت زیر رادیکال ✓

$\begin{cases} -b^2 - b^2 + a = 0 \rightarrow -2b^2 - 2b = 0 \rightarrow -2(b^2 + b) = 0 \rightarrow \begin{cases} b = -1 \checkmark \\ b = 0 \times (a=0) \end{cases} \\ a + b = -b \rightarrow a = -2b \end{cases} \rightarrow \begin{cases} b = -1 \checkmark \\ a = 2 \checkmark \end{cases} \rightarrow a + b = 1 \checkmark$

$y = \frac{r}{\sqrt{an^2 + bn + c}} \quad Df = (-\infty, 2) \rightarrow a=0 \quad y = \frac{r}{\sqrt{bn + c}}$ ✓

$-b < 0, \quad 2b + c = 0 \rightarrow 2a + c - 2|b| = 0 + c + 2b = 2b + c + b = b$ ✓

$$y = \sqrt{\frac{r_n + r}{n + b}} + a \quad D_f = (r, +\infty)$$

$$\rightarrow \frac{r_n + r}{n + b} + a > 0 \rightarrow \frac{r_n + r + a(n + b)}{n + b} > 0 \quad \frac{-b}{-\frac{1}{b} + 1} \quad \text{صورت نامبر شش دانگ است}$$

$$\rightarrow -b = r \rightarrow b = -r$$

$$r + a = 0 \rightarrow a = -r$$

$$\text{الف)} y = \sqrt{x^r - n} \rightarrow x^r - n > 0 \rightarrow n(x^r - 1) > 0 \quad \frac{-1}{-1} \frac{0}{0} \frac{1}{1} \quad D_f = [-1, 0] \cup [1, +\infty)$$

$$\rightarrow y = \frac{1}{\sqrt{|n| - 1}} \rightarrow |n| - 1 > 0 \rightarrow |n| > 1 \rightarrow \begin{cases} n > 1 \\ n < -1 \end{cases} \rightarrow D_f = \mathbb{R} - [-1, 1]$$

$$\text{الف)} y = \sqrt{\frac{1}{|n| - [n]}} \rightarrow |n| - [n] \neq 0 \rightarrow \begin{cases} n > 0 \rightarrow n = [n] \rightarrow n = \{0, 1, 2, \dots\} \\ n < 0 \rightarrow -n = [n] \end{cases} \rightarrow D_f = \mathbb{R} - \{0, 1, 2, 3, \dots\}$$

$$\rightarrow \sqrt{x} + \sqrt{y} = 9 \rightarrow \sqrt{y} = 9 - \sqrt{x} \rightarrow \begin{cases} x \geq 0 \\ 9 - \sqrt{x} \geq 0 \rightarrow x \leq 81 \end{cases} \rightarrow D_f = [0, 81]$$

$$y = \frac{1}{\sqrt{\left[r_n - \frac{1}{r}\right] + \left[r_n + \frac{r}{r}\right]}} \rightarrow \left[r_n - \frac{1}{r}\right] + \left[r_n + \frac{r}{r}\right] > 0 \rightarrow \left[r_n + \frac{r}{r}\right] + \left[r_n + \frac{r}{r}\right] > r$$

$$r \left[r_n + \frac{r}{r}\right] > r \rightarrow \left[r_n + \frac{r}{r}\right] > 1 \rightarrow r_n + \frac{r}{r} > 1 \rightarrow r_n > \frac{1}{r} \rightarrow n > \frac{1}{r}$$

$$y = \sqrt{1 - \log(r_n - a)} \rightarrow \begin{cases} r_n - a \leq 1 \\ r_n - a > 0 \end{cases} \rightarrow \begin{cases} 0 < r_n - a \leq 1 \\ a < r_n \leq 1 + a \\ \frac{a}{r} < x \leq \frac{1 + a}{r} \end{cases}$$

$$D_f = (b, c] \rightarrow \begin{cases} b = \frac{a}{r} \\ c = \frac{1 + a}{r} \end{cases} \rightarrow c - b = \frac{1}{r}$$