

II

الف)
$$x^2 - 2n^2 - 1 \rightarrow y^2 - 1 \xrightarrow{x^2} y^2 - 1$$

 شل ناقص $\downarrow$ $y^2 - 1 \rightarrow y^2 - 1$
 بر طرف مقابل فقط $\rightarrow$ یک مقدار داریم

(۲)

ب) $x \cos y = y \cos x \xrightarrow{\text{میان نقطه}} x = \frac{\pi}{2} \rightarrow y = \frac{\pi}{2}$ ✓ به دست

ج) $\frac{x+y}{2} \geq \sqrt{xy} \quad x, y > 0 \rightarrow x+y \geq 2\sqrt{xy} \rightarrow x^2 + y^2 + 2xy \geq 4xy \rightarrow x^2 + y^2 - 2xy \geq 0$
 $\rightarrow (x-y)^2 \geq 0 \rightarrow x=y$ ✓ به دست

د) $x^2 + 2n - y^2 - 2y = 0 \rightarrow x(y^2 + 2) - y(y^2 + 2) = 0 \rightarrow (x-y)(y^2 + 2) = 0$ ✓ به دست
 $x=y$ ثبت

الف) $|y| + x^2 = 2y \rightarrow y \geq 0 \rightarrow |y| = y \rightarrow y + x^2 = 2y \rightarrow x^2 = y$ ✓ به دست
 $y < 0 \rightarrow |y| = -y \rightarrow -y + x^2 = 2y \rightarrow x^2 = 3y$ ✓ به دست
 چون $x^2 \geq 0$ است $\therefore y \geq 0$ $\therefore y < 0$ ساقط کرد

III

(۲)

ب) $[y] + [x] = 1 \xrightarrow{\text{میان نقطه}} x = 1 \rightarrow y \in [0, 1)$ ✓ به دست

IV

(۲)

$n \geq 3 \leftarrow n-1 \geq 2$
 $n \leq -1 \leftarrow n-1 \leq -2$
 $2 \times (n)^2 - b = a + 6 \rightarrow a + b = 12 - 6 \rightarrow a + b = 6$ ✓

$$\frac{b \ a}{-\phi + \phi -} \quad \begin{array}{l} a \rightarrow a - ba - a^2 z^0 \\ b \rightarrow a - b^2 - b^2 z^0 \rightarrow a - 2b^2 z^0 \end{array} \quad \begin{array}{l} a(1-b-a)z^0 \\ 1-b-a z^0 \rightarrow 1 \checkmark b+a \end{array} \quad \boxed{\Gamma} \quad (r)$$

$$a z^0 \rightarrow b n + c z^0 \rightarrow 2b + c z^0 \rightarrow c z^0 - 2b \rightarrow b < 0 \quad 2a + c - 3|b| \xrightarrow{a z^0} c - 3|b|$$

$$\xrightarrow{b < 0} |b| z^0 - b \rightarrow -2b - 3(-b) z^0 \boxed{b} \checkmark$$

$$1 + b z^0 \rightarrow b z^0 - 2 \checkmark \quad \text{نقطه منعش، هیچ بهر در } n z^0 \text{ صفر شود} \quad \boxed{\Gamma} \quad (r)$$

$$y = \sqrt{x^2 - n} \quad n^2 - n \geq 0 \rightarrow n(n^2 - 1) \geq 0 \rightarrow \underbrace{n}_{\substack{> \\ 1}} \underbrace{(n-1)}_{\substack{> \\ -1}} \underbrace{(n+1)}_{\substack{> \\ -1}} \geq 0 \rightarrow \frac{-1}{-1+1-1+1}$$

$$D_f = [-1, 0] \cup [1, +\infty) \checkmark$$

$$y = \frac{1}{\sqrt{n-1}} \rightarrow |n-1| > 0 \rightarrow |n| > 1 \rightarrow n > 1 \cup n < -1 \rightarrow D_f = (-\infty, -1) \cup (1, +\infty) \checkmark$$

$$y = \sqrt{\frac{1}{|n| - [n]}} \rightarrow |n| - [n] \neq 0 \rightarrow [n] \neq |n| \quad D_f = \mathbb{R} - \{x^+, 0\} \checkmark \quad \boxed{\Lambda} \quad (r)$$

$$\sqrt{x} + \sqrt{y} \geq 9 \quad x \geq 0, y \geq 0 \quad \sqrt{y} \geq 9 - \sqrt{x}$$

$$9 - \sqrt{x} \geq 0 \rightarrow \sqrt{x} \leq 9 \rightarrow x \leq 81$$

$$\textcircled{1} \cap \textcircled{2} \rightarrow D_f = [0, 81] \checkmark$$

[9]

$$y = \frac{1}{\sqrt{[rn - \frac{1}{r}] + [rn + \frac{r}{r}]}} \rightarrow rn + \frac{r}{r} = rn + r - \frac{1}{r} \rightarrow [rn + \frac{r}{r}] = [rn - \frac{1}{r}] + r \quad (r)$$

$$[rn - \frac{1}{r}] + [rn - \frac{1}{r}] + r = r[rn - \frac{1}{r}] + r \rightarrow r[rn - \frac{1}{r}] + r > 0$$

$$[rn - \frac{1}{r}] + 1 > 0 \rightarrow [rn - \frac{1}{r}] \geq 0 \rightarrow rn - \frac{1}{r} \geq 0 \rightarrow rn \geq \frac{1}{r} \rightarrow n \geq \frac{1}{r}$$

$$D_f = [\frac{1}{r}, +\infty) \quad \checkmark$$

$$y = \sqrt{1 - \log(rn - a)} \rightarrow rn - a > 0 \quad 1 - \log(rn - a) \geq 0 \quad \log rn - a \leq 1 \quad (r) \quad [10]$$

$$rn - a \leq 10 \rightarrow 0 < rn - a \leq 10 \rightarrow a < rn \leq a + 10 \rightarrow \frac{a}{r} < n \leq \frac{a+10}{r}$$

$$b = \frac{a}{r}, \quad c = \frac{a+10}{r} \rightarrow c - b = \frac{a+10}{r} - \frac{a}{r} \rightarrow c - b = \frac{10}{r} \quad \checkmark$$