

الف) $y^3 - 2ay^2 = 2a-1$ $y^3 = 2ay^2 + 2a-1$ **تابع است** ✓

ب) $(ay \cos y, y \cos ay)$ $\rightarrow ay = ay^2 \cos y$ $\rightarrow y = \cos y$ **تابع نیست** ✓

ج) $\frac{ay+y}{2} = \sqrt{ay} \rightarrow ay+y-2\sqrt{ay} = 0$ $(\sqrt{ay}-\sqrt{y})^2 = 0$ $\sqrt{ay} = \sqrt{y}$ **تابع است** ✓

د) $ay^2 + 2ay - y^3 = 0$ $ay(y^2+2y) = y^3$ $ay(y+2) = y^2$ **تابع است** ✓

الف) $y^3 + ay^2 = \frac{y^3+y^2}{y} \rightarrow ay^2 = y$ **تابع است** ✓

ب) $y^3 + [y] + [y] = 1$ $y^3 = 1 - 2[y]$ **تابع نیست** ✓

$f(a, z) = \begin{cases} 2ay^2 - b \\ ay + 2ay \end{cases}$ $|ay-1| \geq 2 \rightarrow ay \geq 3$ $ay \geq 1$ **تابع نیست** ✓

$14 - b = 4 + a \rightarrow \sqrt{a+b} = 1$

$a \neq b \rightarrow$ **ریشه** $S: ay + bz = \frac{b}{a} = \frac{b}{-1} = -b$ $a + bz = b$ **تابع نیست** ✓

$ay = b \rightarrow a - b^2 - b^2 = 0$ $-b^2 + a = 0$ $a = b^2$ $a + bz = -1$ **تابع نیست** ✓

$\sqrt{aay^2 + bay + c}$ $ay^2 + bay + c \neq 0$ $\rightarrow$ **تابع نیست** ✓

$bay + c = b^2$ $ay + bz = 0 \rightarrow c = -b^2$ $ay^2 + c = -b^2$ $ay^2 - b^2 = 0$ $-b^2 + b^2 = 0$ **تابع نیست** ✓

$$\sqrt{\frac{ra+r}{a+b} + a} = \sqrt{\frac{ra+r+aa+ab}{a+b}} = \sqrt{\frac{(r+a)(a+b)}{a+b}}$$

$$= \sqrt{(r+a)} \sqrt{\frac{a+b}{a+b}} = \sqrt{(r+a)} \sqrt{1} = \sqrt{(r+a)}$$

$$r+b, \quad \boxed{b^2-r} \quad \checkmark$$

$$r+a = \frac{r}{a+b} + \frac{-b}{\frac{r+a}{a+b}} + \frac{-\frac{r+ab}{r+a}}{\frac{r+a}{a+b}} + \frac{-\frac{r+ab}{r+a}}{\frac{r+a}{a+b}}$$

$$= \frac{r}{a+b} + \frac{-b}{\frac{r+a}{a+b}} + \frac{-\frac{r+ab}{r+a}}{\frac{r+a}{a+b}} + \frac{-\frac{r+ab}{r+a}}{\frac{r+a}{a+b}}$$

ا) $a^2 - a > 0 \quad a(a+1)(a-1) > 0 \quad a^2 \in \{0, -1, +1\}$
 $D_f = [-1, 0] \cup [1, +\infty) \quad \checkmark$

ب) $|a| - 1 > 0 \quad |a| > 1 \rightarrow a > 1 \quad \text{or} \quad a < -1$
 $D_f = (-\infty, -1) \cup (1, +\infty) \quad \checkmark$

ا) $|a| - [a] \neq 0 \quad |a| \neq [a]$
 $\rightarrow$ $|a| \neq [a]$ $\rightarrow$ $|a| \neq [a]$ $\rightarrow$ $|a| \neq [a]$

ب) $\sqrt{a} + \sqrt{y} = 9 \quad (\sqrt{y}, 9 - \sqrt{a})$
 $y = a - 18\sqrt{a} + 81$

$$D_f = \{0\}$$

$$\sqrt{\left[\frac{ra-1}{r}\right] + \left[\frac{ra-1}{r} + \frac{r-1}{r}\right]} \rightarrow \sqrt{\left[\frac{ra-1}{r}\right] + r} \quad r \left(\frac{ra-1}{r} + r\right) > 0, r \neq 0$$

$$\left[\frac{ra-1}{r}\right] > -1 \quad \frac{ra-1}{r} > 0 \quad a > \frac{1}{r} \quad D_f = \left[\frac{1}{r}, +\infty\right) \quad \checkmark$$

$$\frac{r}{a} \text{ في جداول}$$

$$\sqrt{1 - \log(ra-a)} \quad \text{①} \quad ra-a > 0 \quad a > \frac{a}{r}$$

$$\text{②} \quad 1 - \log(ra-a) > 0 \quad \log(ra-a) < 1 \quad ra-a < 10$$

$$D_f = (-b, c] \quad \rightarrow \quad c - b > \frac{a}{r} - \frac{a}{r} \quad \checkmark \quad a < \frac{1}{r} + a$$

$$b > \frac{a}{r} \quad c > \frac{a}{r}$$

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$$f(n) = \begin{cases} 2n^2 - b & n \geq 3 \\ a + 2n & 0 \leq n \leq 3 \\ 2n^2 - b & n \leq -1 \end{cases}$$

$n = 3$ در دو ضابطه مشترک است پس باید مقدارش در هر دو برابر باشد

$$\rightarrow 11 - b = 4 + a$$

$a + b = 12$

۴- دامنه، بازه: $[a, b]$ است یعنی a و b ریشه های معادله $-n^2 - bn + a$ بودند پس:

$$P = \frac{c}{a} = -a = ab \xrightarrow{a \neq 0} b = -1 \quad \star \rightarrow \boxed{a + b = 1}$$

$$S = -\frac{b}{a} = -b = a + b \rightarrow a = -2b \xrightarrow{\star} a = 2$$

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$\cap \rightarrow [0, 1]$

$$\text{ب) } \sqrt{x} + \sqrt{y} = 9 \rightarrow \begin{cases} x \geq 0 \\ \sqrt{y} = 9 - \sqrt{x} \end{cases} \xrightarrow{y \geq 0} 0 \leq x \leq 11$$