

تابع هست ✓. $y_1 = y_2 \rightarrow y_1^3 = y_2^3 \rightarrow y_1^3 = 2x^2 + 2x - 1 \rightarrow y_2^3 = 2x^2 + 2x - 1$ (این)

(۱.۵)

ب) $y = \{x \pm \frac{1}{2}\}$ $\rightarrow \frac{1}{2} \times 0.5 = 0 \rightarrow x = \frac{1}{2}$ $\rightarrow$ $y = \{x \pm \frac{1}{2}\}$

ج) $x + y - 2\sqrt{xy} = 0 \rightarrow (\sqrt{x} - \sqrt{y})^2 = 0 \rightarrow \sqrt{x} = \sqrt{y} \rightarrow x = y$ $\rightarrow$ تابع نیست ✗
تابع هست ✓ $x = y$

الف) $2y - |y| = x^2$ $\begin{cases} y \geq 0 \rightarrow 2y - y = y = x^2 \\ y < 0 \rightarrow 2y - (-y) = 3y = x^2 \end{cases}$ $y = \frac{x^2}{3}$ $\rightarrow$ تابع هست ✓

(۲)

ب) $x = 0.1 \rightarrow [y] = 1 \rightarrow y \in [1, 2)$ $\rightarrow$ تابع نیست ✗

$f(x) = \begin{cases} x^2 - b & |x - 1| \geq 2 \rightarrow x - 1 \geq 2 \rightarrow x \geq 3 \\ a + x & 0 \leq x \leq 3 \end{cases}$ $x - 1 \leq -2 \rightarrow x \leq -1$
 $x = 3 \rightarrow 18 - b = 4 + a \rightarrow a + b = 14$ ✓

(۳)

$\sqrt{a - b} - x^2$ $\rightarrow a - ab - ar^2 = 0$ $\rightarrow a(1 - b - a) = 0$ $\rightarrow a = 0$ $\rightarrow$ ق ق
 $a(1 - b - a) = 0 \rightarrow 1 - b - a = 0 \rightarrow a + b = 1$
ب) $a - b^2 - b^2 = 0 \rightarrow a = 1 - b$ $\rightarrow$ $2b^2 + b - 1 = 0$ $\rightarrow$ $b = -1$ $\rightarrow$ $a = 1 - b = 2$ $\rightarrow$ $a + b = 2 - 1 = 1$ ✓

(۴)

$\sqrt{ax^2 + bx + c} \rightarrow \frac{1}{2} = 2 \rightarrow 2b + c = 0 \rightarrow c = -2b$
 $D = (-\infty, 2) \rightarrow$ $a = 0$ $\rightarrow$ $a + c = 3|b| = 0$ $\rightarrow$ $-2b = 3(-b) = b$ ✓

(۵)

$$y = \sqrt{\frac{3x+2}{x+b} + a} \quad D_f = (2, +\infty) \rightarrow \text{ریشه منجم} = 2$$

$$2+b=0 \rightarrow \boxed{b = -2} \checkmark$$

(2)
6

الف) $x^3 - x \geq 0$

$$x(x+1)(x-1) \geq 0 \quad \begin{array}{ccc|c} -1 & 0 & 1 & \\ \hline - & + & - & + \end{array}$$

$\downarrow \quad \downarrow \quad \downarrow$
 $0 \quad -1 \quad 1$

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

ب) $|x| - 1 > 0$

$$|x| > 1 \rightarrow \begin{array}{c} x > 1 \\ \text{یا} \\ x < -1 \end{array}$$

$$D = (-\infty, -1) \cup (1, +\infty) \checkmark$$

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الف) $x \neq 0$ منجم $\neq 0$

$|x| \neq [x] \rightarrow x \neq \text{عدد صحیح مثبت}$

$$D = \mathbb{R} - \{x | x \in \mathbb{Z}, x \geq 0\} \checkmark \rightarrow D = \mathbb{R} - \mathbb{N}$$

(1,5)

ب) $\sqrt{x} + \sqrt{y} = 9$

$$\sqrt{y} = 9 - \sqrt{x}$$

$$x \geq 0$$

$$y = 81 + x - 18\sqrt{x}$$

$$D = [0, +\infty)$$

1

$$\left[2x - \frac{1}{x}\right] + \left[2x + \frac{3}{x}\right] = 0$$

$$\downarrow \quad \uparrow \quad \uparrow$$

عدد غنی هیچ غیر توانی نیست

$$[2x] = -1$$

$$-1 \leq 2x < 0$$

$$-\frac{1}{2} \leq x < 0$$

$$[2x+1] + [2x+1] = 0$$

$$2[2x+1] = 0$$

$$[2x+1] = 0$$

$$D = \mathbb{R} - \left[-\frac{1}{2}, 0\right)$$

9

$$y = \sqrt{1 - \log(x-a)}$$

$$\rightarrow x-a > 0$$

$$x > a$$

$$x > \frac{a}{p}$$

$$\downarrow$$

$$\frac{a}{p} = b$$

$$a + \frac{a}{p} = c$$

$$n = (b, c]$$

$$c - b =$$

$$a + b - b = \boxed{a} \checkmark$$

$$1 - \log(x-a) \geq 0$$

$$\log(x-a) \leq 1$$

$$x-a \leq 10$$

$$x \leq 10 + a$$

$$\leftarrow x \leq a + \frac{a}{p}$$

(2)
10

$$د) xy^2 + 2x - y^2 - 2y = 0 \rightarrow x(y^2 + 2) - y(y^2 + 2) = 0 \quad -1$$

$$(y^2 + 2)(x - y) = 0 \rightarrow x = y \quad \text{تابع مستقیم}$$

↓
معمولاً در جواب

$$ب) \sqrt{x} + \sqrt{y} = 9 \rightarrow \begin{cases} x \geq 0 \\ \sqrt{y} = 9 - \sqrt{x} \end{cases} \xrightarrow{y \geq 0} 0 \leq x \leq 81 \quad \xrightarrow{\cap} [0, 81]$$

$$\left[2x - \frac{1}{x}\right] + \left[2x + \frac{1}{x}\right] > 0 \rightarrow \left[2x - \frac{1}{x}\right] + \left[2x - \frac{1}{x} + 2\right] > 0 \quad -9$$

$$2\left[2x - \frac{1}{x}\right] + 2 > 0 \rightarrow \left[2x - \frac{1}{x}\right] > -1 \rightarrow 2x - \frac{1}{x} \geq 0 \rightarrow \boxed{x \geq \frac{1}{2}}$$

$$D = \left[\frac{1}{2}, +\infty\right)$$