

الف) $y^3 - 2x^2 = 2x - 1$ $y^3 = 2x^2 + 2x - 1 \Rightarrow x_1 = x_2$ $y^3 = 2x_1^2 + 2x_1 - 1$ $y_1^3 = y_2^3 \Rightarrow y_1 = y_2$ (تابع هست) ✓	ب) $x \cos y = y \cos x$ $90 \cos y = 0 \Rightarrow x = 90$ y می تواند در تمام راسته باشد در $\frac{\pi}{2}, \frac{3\pi}{2}$ می (تابع نیست) ✗	ج) $\frac{x+y}{2} = \sqrt{xy} \Rightarrow x=y$ $x+y = 2\sqrt{xy} \Rightarrow x^2 + y^2 + 2xy = 4xy$ $\Rightarrow x^2 - 2xy + y^2 = 0 \Rightarrow (x-y)^2 = 0 \Rightarrow x=y$ (تابع هست) ✓	د) $x^2 + 2x - y^2 - 2y = 0$ $x^2 - y^2 + 2x - 2y = 0$ $(x^2 - y^2) + 2(x - y) = 0$ $(x+y)(x-y) + 2(x-y) = 0$ $(x-y)(x+y+2) = 0$ $x=y$ (تابع هست) ✓
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الف) $ y + x^2 = 2y$ (تابع هست) ✓ $x^2 = 2y - y $ $x^2 \geq 0 \Rightarrow 2y - y \geq 0 \Rightarrow y \geq 0$ $x^2 = y \Rightarrow x_1 = x_2 \Rightarrow y_1 = y_2$ (تابع هست) ✓	ب) $[y] + [x] = 1$ (تابع نیست) ✗ $[x] = 0 \Rightarrow x \in [0, 1)$ $[y] = 1 \Rightarrow y \in [1, 2)$ (تابع نیست) ✗
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$f(x) = \begin{cases} 2x^2 - b & |x-1| \geq 2 \\ a+x & -2 \leq x \leq 2 \end{cases}$

$x=3 \Rightarrow 12 - b = a + 6 \Rightarrow a + b = 12$

$f(x) = \sqrt{a - bx - x^2}$ $D_f = [b, a]$ $a+b=?$ ($a \neq 0, b \in \mathbb{Z}$)

$0 = (x-a)(x-b) \Rightarrow x^2 - (a+b)x + ab = 0$
 $x^2 + bx - a = 0$
 $b = -a - b \Rightarrow 2b = -a$
 $ab = -a \Rightarrow b = -1$

$y = \frac{2}{\sqrt{ax^2 + bx + c}}$ $D_f = (-\infty, 2)$ $b^2 - 4ac = 0$

$(b+c)^2 = 0 \Rightarrow b = -c$
 $c = -b$

$4ac + 2bc + c^2 = 0 \Rightarrow 4a(-c) + 2(-c)(-c) + (-c)^2 = 0$
 $-4ac + 2c^2 + c^2 = 0 \Rightarrow -4a + 3c = 0 \Rightarrow c = \frac{4a}{3}$
 $b = -c = -\frac{4a}{3}$

$-\frac{4b}{3} + b - 3b = -\frac{19}{3}b$

$(c = -b), a = \frac{c}{4} \Rightarrow (a = -\frac{b}{4})$

جواب نهایی

$$y = \sqrt{\frac{3a+2}{n+b}} + a \quad D_f = (2, +\infty)$$

(صحن باره باره)
(نیت)
 $n+b=0 \Rightarrow x = -b$

$$b = -2$$

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الف) $y = \sqrt{x^2 - 2} \Rightarrow x^2 - 2 \geq 0 \Rightarrow$

$$x(x^2 - 1) \geq 0 \quad \begin{array}{c} -1 & 0 & 1 \\ - & + & - & + \\ 0 & 1 & -1 & 0 \end{array}$$

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

ب) $y = \frac{1}{\sqrt{|x| - 1}} \Rightarrow |x| - 1 > 0$

$\Rightarrow |x| > 1 \Rightarrow \begin{array}{c} x > 1 \\ x < -1 \end{array}$

$$D_f = \mathbb{R} - [-1, 1]$$

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الف) $y = \sqrt{\frac{1}{|x| - [x]}} \Rightarrow |x| - [x] \neq 0$

$\Rightarrow |x| \neq [x] \Rightarrow D_f = \mathbb{R} - \mathbb{Z}$
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ب) $\sqrt{x} + \sqrt{y} = 9$
 $\begin{array}{c} 0 \\ \vdots \\ 1 \end{array} \quad \begin{array}{c} 1 \\ \vdots \\ 0 \end{array}$

$$D_f = [0, 1]$$

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$$y = \frac{1}{\sqrt{\left[x_2 - \frac{1}{x}\right] + \left[x_2 + \frac{2}{x}\right]}} \Rightarrow \left[x_2 - \frac{1}{x}\right] + \left[x_2 + \frac{2}{x}\right] > 0 \Rightarrow 2\left[x_2 - \frac{1}{x}\right] + \frac{1}{x} > 0$$

$\Rightarrow \left[x_2 - \frac{1}{x}\right] > -1 \Rightarrow x_2 - \frac{1}{x} \geq 0 \Rightarrow x \geq \frac{1}{2} \Rightarrow D_f = \left[\frac{1}{2}, +\infty\right)$

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

$$D_f = (b, c]$$

$$c - b = ? \quad d$$

$$xn - a > 0$$

$$1 - \log(xn - a) = 0 \Rightarrow 1 = \log_{10}(xn - a) \Rightarrow 10 = xn - a$$

$$xb = a$$

$x = c \Rightarrow 10 = xc - a \Rightarrow d = c - b$

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