

$$\text{الف) } y^n - x^n = x - 1 \Rightarrow \text{برای } n=2 \begin{cases} y_1^2 = x_1^2 + x_1 - 1 \\ y_2^2 = x_2^2 + x_2 - 1 \end{cases} \rightarrow y_1^2 = y_2^2 \Rightarrow y_1 = y_2 \quad \text{پاسخ} \quad (1)$$

$$\text{ب) } x \cos y = y \cos x \xrightarrow{x=\frac{\pi}{2}} \frac{\pi}{2} \cos y = y \cos \frac{\pi}{2} \Rightarrow \cos y = 0 \rightarrow y = k\pi + \frac{\pi}{2} \quad \text{پاسخ} \quad (1)$$

$$\text{ج) } \frac{x+y}{r} = \sqrt{xy} \rightarrow x+y = r\sqrt{xy} \rightarrow x+y - r\sqrt{xy} \rightarrow (\sqrt{x} - \sqrt{y})^2 \geq 0 \rightarrow \sqrt{x} = \sqrt{y} \quad \text{پاسخ} \quad (1)$$

$$\text{د) } xy^2 + x^2 - y^2 - xy = 0 \rightarrow xy^2 - y^2 + x^2 - xy = 0$$

$$y^2(x-y) + x(x-y)$$

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

$$\text{الف) } |y| + x^2 = 2y \rightarrow \text{پاسخ}$$

$$x^2 = 2y - |y| \xrightarrow{y \geq 0} 2y - y = x^2$$

$$y - |y| \geq 0$$

$$|y| \leq y$$

$$-y \leq y \leq y \rightarrow$$

$$\begin{cases} x \geq 0 \\ x \leq y \end{cases}$$

$$\text{ب) } [y] + [x] = 1$$

$$[y] = 1 - [x]$$

$$\xrightarrow{x=1} [y] = 0$$

$$1 \leq y < 2 \rightarrow \text{پاسخ}$$

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

$$x=3 \rightarrow x^2 - b = 1 - b \quad 1 - b = 4 + a$$

$$a + x^2 = 4 + a \quad \text{پاسخ} \quad (1)$$

$$f(x) = \sqrt{a - bx - x^2} \rightarrow -(x^2 + bx - a)$$

$$-a = ab$$

$$b = -1$$

$$a + b = -1 + 2 = 1$$

$$\begin{vmatrix} b & a \\ + & - \end{vmatrix} +$$

$$-(x-b)(x-a)$$

$$-(x^2 - (b+a)x + ab)$$

$$-b - a = +b$$

$$+1 - a = -b \rightarrow a = 2$$

$$y = \frac{x}{\sqrt{ax^2 + bx + c}} \rightarrow a = 0$$

$$bx + c > 0 \rightarrow x > -\frac{c}{b}$$

$$-\frac{c}{b} = 2$$

$$c = -2b$$

$$2a + c = 2|b|$$

$$2b - 2b = 0 \quad \text{پاسخ} \quad (b)$$

جواب: با استفاده از اعداد صحیح

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(4)

$$y = \sqrt{\frac{r^2x + r}{x + b}} + a \quad \frac{r^2x + r}{x + b} + a \xrightarrow{a=r} \frac{r^2x + r}{x + b} + a$$

$$\frac{r^2x + r + ax + ab}{x + b} \rightarrow \frac{a(r + a) + r + ab}{x + b} \rightarrow \frac{a(r + a) + r + ab}{x + b} \rightarrow a + r = 0 \rightarrow a = -r$$

وحيث ان $a + r = 0 \rightarrow a = -r$
 $x + b \Rightarrow b = -r$
 حيث ان $a = -r$ و $b = -r$

$$21) y = \sqrt{x(n-1)(n+1)} \Rightarrow D_f = [-1, 1] \cup [1 + \infty)$$

$\frac{1}{-1} + \frac{1}{1} + \frac{1}{1} + \frac{1}{1}$

(5)

$$22) y = \frac{1}{\sqrt{|x| - 1}} \Rightarrow |x| - 1 > 0 \rightarrow |x| > 1 \rightarrow x > 1, x < -1 \rightarrow (-\infty, -1) \cup (1, +\infty)$$

$$y = \sqrt[3]{\frac{1}{|x| - [x]}} \rightarrow |x| - [x] \neq 0 \rightarrow |x| \neq [x] \rightarrow D_f = \mathbb{R} - \mathbb{Z}$$

$\frac{1}{|x| - [x]}$  $\rightarrow$ $\frac{1}{|x| - [x]}$

$$\sqrt{x} + \sqrt{y} = 9 \rightarrow 9 - \sqrt{x} = \sqrt{y} \Rightarrow 9 - \sqrt{x} \geq 0 \rightarrow \sqrt{x} \leq 9 \rightarrow -1 \leq x \leq 81 \rightarrow [-1, 81]$$

$$y = \frac{1}{\sqrt{[x - \frac{1}{r}] + [x + \frac{r}{r}]}} \quad D_f = (\frac{1}{2}, +\infty)$$

$$\frac{1}{r} < x - \frac{1}{r} \rightarrow \frac{1}{2} < x$$

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

(1)

$$y = \sqrt{1 - \log(r^2x - a)} \rightarrow r^2x - a > 0$$

$$r^2x > a$$

$$1 - \log(r^2x - a) \geq 0$$

$$\log(r^2x - a) \leq 1$$

$$r^2x - a \leq 1$$

$$r^2x \leq 1 + a$$

$$\frac{a}{r^2} < x \leq \frac{1 + a}{r^2} \rightarrow$$

$$\frac{1 + a}{r^2} = C$$

$$C - b \leq \frac{1 + a}{r^2} - \frac{a}{r^2} = \frac{1}{r^2}$$

P4PCO