

الف) $(x, y) \in \mathbb{R}^2 \rightarrow x = x_1, y = y_1 \rightarrow y_1^2 = x_1^2 + x_1 - 1 \rightarrow y_1 = y_1$ تابع است ✓ شایان روی داده ۲۰

ب) $x = \frac{\pi}{4} \rightarrow \frac{\pi}{4} \cos y = y \cos(\cdot) \rightarrow \cos y = 0 \rightarrow y \in \{k\pi + \frac{\pi}{2}\} \oplus$ تابع نیست ✓ (۲)

ج) $x^2 + y^2 + 2xy = 2xy \rightarrow (x - y)^2 = 0 \rightarrow |x - y| = 0 \rightarrow x - y = 0 \rightarrow x = y$ تابع است ✓ ۱

د) $y^2 + 2y = xy^2 + 2x \rightarrow x = \frac{y^2 + 2y}{y^2 + 2} = y \left(\frac{y^2 + 2}{y^2 + 2} \right) = y \rightarrow x = y$ تابع است ✓ ۲

الف) $\begin{cases} y \geq 0 \rightarrow x^2 = y \\ y < 0 \rightarrow x^2 = -y \end{cases}$  تابع است ✓ (۲) ۲

ب) $x = 1 \rightarrow [y] + [1] = 1 \rightarrow [y] = 0 \rightarrow 0 \leq y < 1$ تابع نیست ✓

$|x - 1| \geq 2 \rightarrow \begin{cases} x - 1 \geq 2 \rightarrow x \geq 3 \\ x - 1 \leq -2 \rightarrow x \leq -1 \end{cases}$

if $0 \leq x \leq -1 \rightarrow 2x^2 - b = a + 2x$

if $x = 3 \rightarrow f(x) = 2x^2 - b = a + 2x \rightarrow a + b = 2x^2 - 2x = 12$ ✓

$\rightarrow a + b = 12$

$-x^2 - bx + a \geq 0 \rightarrow D_f = [b, a] = \text{فاصله میانه های تابع}$ 

$a + b = \frac{a+b}{-1} = -b \rightarrow a = -2b \rightarrow a = 2$ ✓ (۲) ۲

$ab = \frac{a+b}{-1} = -a \rightarrow a = 0$ عقده $b = -1$ ✓ ✓

$a + b = 2 - 1 = 1$ ✓

$ax^2 + bx + c > 0$  دامنه یک بازه از منحنی بی نهایت تا یک عدد است ← تابع درجه ۱



$a = 0, b < 0, b(2) + c = 0 \rightarrow c = -2b$ ✓



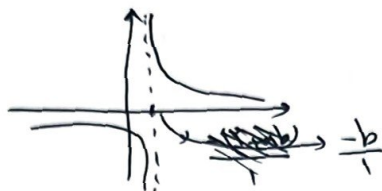
$y = bx + c$

$\rightarrow 3a + c - 3|b| = 3(0) + (-2b) - 3(-b) = b$ ✓ (۲) ۳

$$\frac{r_{n+1}}{n+b} + a > 0$$

$$x \neq 0 \rightarrow x+b=0 \rightarrow r+b=0 \rightarrow b=-r$$

$$\rightarrow \frac{(r+a)n + r+ab}{n+b} > 0$$



$$\rightarrow D = (-b, +\infty)$$

$$-b=r \rightarrow b=-r$$

(r)

4

$$\text{الف) } x^3 - x > 0 \rightarrow x(x+1)(x-1) > 0$$

	-1	0	1	
x	-	-	+	+
x+1	-	0	+	+
x-1	-	-	-	0
x^3-x	-	+	-	+

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

(r)

V

$$\text{ب) } |x|-1 > 0 \rightarrow x > 1 \text{ or } x < -1 \rightarrow D_y = \mathbb{R} - [-1, 1]$$

$$\text{الف) } |x| - [x] \neq 0 \begin{cases} x \in \mathbb{Z} \rightarrow |x| - [x] = 0 \\ x \notin \mathbb{Z} \rightarrow |x| - [x] \neq 0 \end{cases} \begin{cases} x > 0 \rightarrow x - [x] = 0 \\ x < 0 \rightarrow -x - [x] \neq 0 \\ x = 0 \rightarrow 0 \end{cases}$$

$$D = \mathbb{R} - \mathbb{Z}^+ \setminus \{0\} \Rightarrow D = \mathbb{R} - \mathbb{W}$$



$$D_y = [0, 1]$$

(r)

^

$$\left[r_{n-\frac{1}{p}} \right] + \left[r_{n+\frac{r}{p}} \right] > 0 \rightarrow r \left[r_{n+\frac{1}{p}} \right] + \frac{1}{p} > 0 \rightarrow \left[r_{n+\frac{1}{p}} \right] > -\frac{1}{r}$$

$$\rightarrow 0 < \left[r_{n+\frac{1}{p}} \right] \rightarrow 0 \leq r_{n+\frac{1}{p}} \rightarrow \frac{1}{r} \leq n \rightarrow D_y = \left[\frac{1}{r}, +\infty \right)$$

(r)

9

$$1 - \log^{r_{n-a}} \geq 0 \rightarrow \log^{r_{n-a}} \leq 1 \rightarrow r_{n-a} \leq 10 \rightarrow n \leq \omega + \frac{a}{r} \rightarrow c = \omega + \frac{a}{r}$$

$$r_{n-a} > 0 \rightarrow n > \frac{a}{r} \rightarrow b = \frac{a}{r}$$

$$c - b = \omega + \frac{a}{r} - \frac{a}{r} = \omega$$

(r)

10