

الف) $y^3 - 2x^2 = 2x - 1 \rightarrow y^3 = 2x^2 + 2x - 1$

ب) $\begin{cases} \text{if } (x_1, y_1) \in f \\ \text{if } (x_2, y_2) \in f \end{cases} \xrightarrow{x_1=x_2} y_1 = y_2 \Rightarrow y_1^3 = 2x^2 + 2x - 1 \Rightarrow y_1^3 = y_2^3 \rightarrow y_1 = y_2$ تابع است

ج) $\frac{x=y}{x=y} \Rightarrow y = yx_0 \rightarrow y = 0 \Rightarrow \begin{cases} y = \frac{x}{x} \end{cases}$ تابع نیست

د) $x(y^2+2) - y(y^2+2) = 0 \rightarrow (y^2+2)(x-y) = 0 \Rightarrow \begin{cases} x+y = \sqrt{xy} \rightarrow x+y = 2\sqrt{xy} \Rightarrow x^2+y^2+2xy = 4xy \Rightarrow x^2+y^2-2xy = 0 \Rightarrow (x-y)^2 = 0 \Rightarrow x=y \end{cases}$ تابع است

الف) $|y| + x^2 = 2y \rightarrow \begin{cases} y = x^2 \\ y = -x^2 \end{cases} \Rightarrow \begin{matrix} y > 0 \\ y = 0 \\ y < 0 \end{matrix}$ تابع است

ب) $[y] + [x] = 1 \Rightarrow \begin{cases} \text{if } x=0 \\ y=1, 2, 3, \dots \end{cases} \Rightarrow$ پس به ازای یک دوری تعداد زیادی ضربی می‌تواند تابع نیست

$f(x) = \begin{cases} 2x^2 - b & x \geq 3 \\ a + 2x & 0 \leq x < 3 \\ 2x^2 - b & x < -1 \end{cases} \Rightarrow \text{if } x=3 \rightarrow 18 - b = a + 6 \rightarrow a + b = 12$

$f(x) = \sqrt{-x^2 - bx + a}$ بازه $[b, a]$ $\begin{cases} \frac{b+a}{2} = \frac{b}{-2} \end{cases} \Rightarrow -a - b = b \rightarrow -2b = a$

$\Rightarrow P = ab = 2b \rightarrow a = 2, b = -1 \Rightarrow a + b = 1$

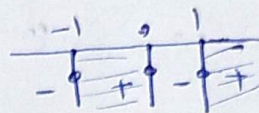
$\sqrt{ax^2 + bx + c} \rightarrow ax^2 + bx + c > 0 \Rightarrow \begin{cases} a = 0 \\ 2b + c = 0 \rightarrow c = -2b \end{cases}$

$\Rightarrow \frac{3a + c - 5|b|}{0} = \frac{c - 5|b|}{0} = \frac{c + 3b}{0} = \frac{-2b + 3b}{0} = \frac{b}{0}$

$$y = \sqrt{\frac{x(x+a)+r+ab}{x+b}} \Rightarrow D_f = (r, +\infty) \Rightarrow \begin{cases} x+b \neq 0 \\ x(x+a)+r+ab \geq 0 \end{cases}$$

$$\Rightarrow b = -r$$

$$(الف) y = \sqrt{x^2 - 1} \Rightarrow x^2 - 1 \geq 0 \rightarrow x(x^2 - 1) \geq 0$$



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

$$-) y = \frac{1}{\sqrt{|x|-1}} \rightarrow \begin{cases} |x|-1 > 0 \rightarrow |x| > 1 \rightarrow \begin{matrix} x > 1 \\ x < -1 \end{matrix} \text{ (I)} \\ |x|-1 \neq 0 \rightarrow x \neq \{1, -1\} \text{ (II)} \end{cases} \Rightarrow D_f = \mathbb{R} - [-1, 1]$$

$$(الف) \sqrt{\frac{1}{|x|-[x]}} \Rightarrow |x|-[x] \neq 0 \rightarrow [x] \neq |x| \Rightarrow D_f = \mathbb{R} - \mathbb{W}$$

$$-) \sqrt{x} + \sqrt{y} = 9 \rightarrow \sqrt{y} = 9 - \sqrt{x} \begin{cases} \sqrt{x} \rightarrow x \geq 0 \\ 9 - \sqrt{x} \geq 0 \rightarrow \sqrt{x} \leq 9 \rightarrow x \leq 81 \end{cases} \Rightarrow D_f = [0, 81]$$

$$y = \frac{1}{\sqrt{[rx - \frac{1}{r}] + [rx + \frac{r}{r}]}} \Rightarrow [rx - \frac{1}{r}] + [rx + \frac{r}{r}] > 0 \rightarrow [rx - \frac{1}{r}] + [rx - \frac{1}{r}] + r > 0$$

$$\Rightarrow 2[rx - \frac{1}{r}] > -r \Rightarrow [rx - \frac{1}{r}] > -\frac{r}{2} \Rightarrow x > \frac{1}{r} \Rightarrow D_f = [\frac{1}{r}, +\infty)$$

$$\sqrt{1-g(xn-a)} \Rightarrow \begin{cases} g(xn-a) \leq 1 \rightarrow 1.0 > xn-a \rightarrow xn \leq 1+a \\ xn-a > 0 \rightarrow xn > a \end{cases} \Rightarrow a < xn \leq 1+a$$

$$r \cdot b < xn < r \cdot c$$

$$\Rightarrow r \cdot c - b = 1 + a - a$$

$$c \cdot b = a$$