

الف) $y^3 - 2y^2 + 2y - 1 \rightarrow y^3 - 2y^2 + 2y - 1 \xrightarrow{y_1 = y_2} y^3 - 2y^2 + 2y - 1$ تابع ✓

ب) $n \cos y = y \cos n \xrightarrow{n = \frac{\pi}{2}} \frac{\pi}{2} \cos y = 0$ تابع ✗

ج) $\frac{n+y}{2} = \sqrt{ny} \xrightarrow{n=y} n = y$ تابع ✓

د) $x^2 + 2x - y^3 - 2y = 0 \rightarrow x = \frac{y^3 + 2y}{y^2 + 2} \rightarrow x = y$ تابع ✓

الف) $|x^2 + 1| = 2y$ تابع ✓

ب) $x^2 = 2y \rightarrow y = \frac{x^2}{2}$ تابع ✓

ب) $[y] + [x] = 1$ تابع نیست

$x=0 \rightarrow [y] = 1 \rightarrow 1 \leq y < 2 \rightarrow$ تابع ✗

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

$n=2 \rightarrow f(2) = 2 \rightarrow a+4=2 \rightarrow a=-2$

$n=3 \rightarrow f(3) = 12 \rightarrow a+6=12 \rightarrow a=6$

$Df = [b, a]$

$f(n) = \sqrt{a - bn - n^2}$, $(a \neq 0, b \in \mathbb{Z})$

$a - b^2 - b^2 = 0 \rightarrow a = 2b^2$

$a - ab - a^2 = 0 \rightarrow a = ab + a^2 \rightarrow 2b^2 = 2b^2 + 4b^3 - 2b^2$

$2b^2(2b^3 + b - 1) = 0$

$(b+1)(b-1)(b-2) = 0$

$b = -1, 1, 2$

$a = 2, 2, 8$

$y = \frac{r}{\sqrt{ax^2 + bx + c}}$

$Df = (-\infty, 2) \rightarrow$ یک ریشه منفی!

$a=0 \rightarrow x = -\frac{c}{b} > 2 \rightarrow c < -2b$

$a=2 \rightarrow x = -\frac{c}{2} > 2 \rightarrow c < -4$

$$y = \sqrt{\frac{x^2 + 2x + 1}{x + b}} + a$$

$$y = \sqrt{\frac{x^2 + 2x + 1 + a^2 + 2ax + ab}{x + b}}$$

$D_f = (x) + \infty \rightarrow \sqrt{x^2 + 2x + 1} \rightarrow y = \sqrt{\frac{\Delta}{x - 2}}$

$x = -b \rightarrow -b = 2 \rightarrow b = -2$

$\frac{\Delta}{x - 2} \geq 0$

$\frac{\Delta}{x - 2} \geq 0$

الف) $y = \sqrt{x^2 - x}$

$x(x-1)(x+1) \geq 0$

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

ب) $y = \frac{1}{\sqrt{|x| - 1}}$

$|x| - 1 > 0$

$|x| > 1$

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

$x < -1 \rightarrow D_f = (-\infty, -1) \cup (1, +\infty)$

ج) $y = \sqrt{\frac{1}{|x| - [x]}}$

$|x| \neq [x]$

$D_f = \mathbb{R} - \{x \mid x = k, k \in \mathbb{Z}\}$

$x \notin \mathbb{Z} \rightarrow x \neq [x]$

$x > 0$

$x < 0 \rightarrow \mathbb{R} \leftarrow -x \neq [x]$

$x < 0$

$D_f = \mathbb{R} - \{0, 1, 2, 3, \dots\}$

د) $\sqrt{x} + \sqrt{y} = 9 \rightarrow \sqrt{y} = 9 - \sqrt{x}$

$x \geq 0$

$9 - \sqrt{x} \geq 0 \rightarrow x \leq 81 \rightarrow D_f = [0, 81]$

$y = \frac{1}{\sqrt{[x - \frac{1}{x}] + [x + \frac{1}{x}]}}$

$\sqrt{[x - \frac{1}{x}] + [x + \frac{1}{x}]} \geq 1$

$[x - \frac{1}{x}] + [x + \frac{1}{x}] \geq 1$

$[x - \frac{1}{x}] \geq 1$

$x - \frac{1}{x} \geq 1$

$x^2 - 1 \geq x$

$x^2 - x - 1 \geq 0$

$D_f = [\frac{1}{2}, +\infty)$

$y = \sqrt{1 - 2^{x-a}}$

$1 - 2^{x-a} \geq 0$

$1 \geq 2^{x-a}$

$x \leq \frac{1+a}{\ln 2}$

$D_f = (\frac{a}{\ln 2}, \frac{a+1}{\ln 2}]$

$c - b = \frac{1+a-a}{\ln 2} = \frac{1}{\ln 2}$