

1910

موضوعی

2

✓ الف) $y'' - ky' = yx - 1$ $y_1'' = ky_1' + yx - 1$ $y_2'' = ky_2' + yx - 1$ $y_1'' = y_2'' \Rightarrow y_1 = y_2$ تابع 10

✓ ب) $x \cos y = y \cos x$ $x = \frac{\pi}{2} \Rightarrow \frac{\pi}{2} \cos y = y \cos \frac{\pi}{2}$ $\cos y = 0 \Rightarrow y = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \dots$ $x = \frac{\pi}{2}$ دارای چند مقدار می شود، تابع نیست.

✓ ج) $\frac{x+y}{y} = \sqrt{xy} \Rightarrow x+y - 2\sqrt{xy} = 0$ $(\sqrt{x} - \sqrt{y})^2 = 0 \Rightarrow \sqrt{x} = \sqrt{y} \Rightarrow x = y$ تابع 10

✓ د) $xy' + kx - y'' - ky = 0 \Rightarrow y'' + ky = xy' + kx$ $(y' + y) \leftarrow$ تابع است 10

$f(x) = \begin{cases} kx^2 - b & |x-1| \geq 2 \\ a + kx & -2 \leq x \leq -1 \end{cases}$ $x = -1$ $2 - b = a - 4$ $a + b = 6$ 2

$f(x) = \sqrt{a - bx - x^2}$ $[b, a]$ $a + b = -b$ $a = -2b = 2 \Rightarrow a + b = 1$ $b = -1$ $a + b = -1$ 2

$y = \frac{2}{\sqrt{ax^2 + bx + c}}$ $D_f = (-\infty, r)$ $a = 0$ $2b + c = 0$ $c = -2b$ $2a + c - 2|b| \rightarrow -2b + 2b = 0$ 2

الف) $f(x) = \sqrt{\frac{1}{|x| - [x]}}$ $D_f = \mathbb{R} - \{ \text{شماره صحیح} \} = |x| = [x]$ $x = [x] \Rightarrow x = x \Rightarrow \frac{1}{x - x}$ $x = [x] \Rightarrow -x = x$ $\mathbb{R} - \{ x \in \mathbb{Z}^+, x = 0 \}$ 2

ب) $f(x) = \sqrt{x} + \sqrt{y} = 9$ $x \geq 0, y \geq 0$ $0 < x < 1$ $y \geq 0 \Rightarrow 9 - \sqrt{x} \geq 0 \Rightarrow \sqrt{x} \leq 9$

الف) $f(x) = \sqrt{1 - \log x}$ $x-1 > 0 \Rightarrow x > 1$ $\log x > 0 \Rightarrow x > 1$ $\frac{1}{x} < x < 1 \Rightarrow x-1 < 1 \Rightarrow x < \frac{2}{x} \Rightarrow \frac{1}{x} < x < \frac{2}{x}$ $1 < x \Rightarrow x-1 > 1 \Rightarrow x > \frac{2}{x} \Rightarrow x > 1$

$$D_f = \left\{ \frac{1}{x} < x < \frac{2}{x} \right\} \cup \{x > 1\}$$

عوض حقیقی

$$\sqrt{|x|} = t$$

ب) $f(x) = \log \frac{1}{4 + \sqrt{|x|} - |x|}$

$$+ \frac{1}{4 + t - t^2} > 0$$

$$-(t^2 - t - 4) = -(t-3)(t+2)$$

تغییر

$$\frac{-9}{-1+1-}$$

$D_f = (-9, 9)$ (2)

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

در صورتی که x و y در $\mathbb{R}$ و a, b در $\mathbb{R}$ و $x+b > 0$

$$x+b=0$$

$$b=-x$$

$$b=-x$$

مطلوبه نبوی

صورت به عبارات تعیین 2 و 0 بود

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

$$y = \sqrt{f(x) - x + 1}$$

$$f(x) > x-1$$

$$f(x) = \begin{cases} 2x-1 & [x] > 4 \\ 5x+3 & [x] \leq 4 \end{cases}$$

$$2x-1 > x-1 \Rightarrow x > 0 \Rightarrow x > 0$$

$$5x+3 > x-1 \Rightarrow 4x > -4 \Rightarrow x > -1 \Rightarrow -1 < x < 0$$

$$D_f = \{x > 0\} \cup \left\{ -\frac{4}{5} < x < 0 \right\} \rightarrow \left[-\frac{4}{5}, +\infty \right)$$

$$y = \frac{25x^2 + 44x^2 + 11x + 3}{(5x^2 + 5x + 1)^2} = \frac{3(11x^2 + 12x^2 + 4x + 1)}{(5x+1)^2} = \frac{3(11x+1)}{(5x+1)^2} = \frac{3}{5x+1}$$

$$D_f = \mathbb{R} - \left\{ -\frac{1}{5} \right\}$$

$$y = \sqrt{1 - \log(x-a)} \quad D_f = (b, c]$$

$$c-b = \frac{a+10}{1} - \frac{a}{1} = \frac{10}{1} = 10$$

$$x > a \quad x > \frac{a}{1}$$

$$1 > \log_{10} \frac{x-a}{1} \Rightarrow x-a < 10 \Rightarrow x < \frac{a+10}{1}$$

$\Rightarrow$

$$\Rightarrow D_f = \frac{a}{1} < x < \frac{a+10}{1}$$