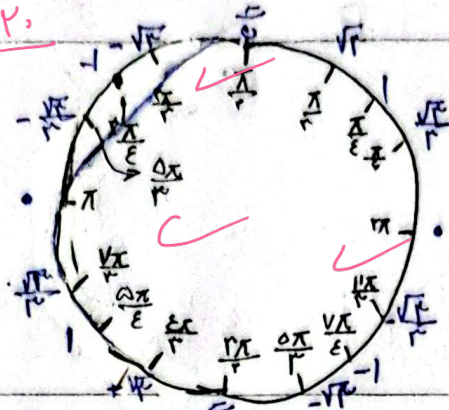


آفرین علی نوشتن آفرین است



$$\sin \frac{\pi}{6} + \cos \pi + \tan \frac{\pi}{6} = \frac{1}{2} + -1 - \frac{1}{\sqrt{3}} = -\frac{1}{2} - \frac{1}{\sqrt{3}}$$

$$-\cos \frac{5\pi}{6} + \sin \frac{2\pi}{3} + \tan \frac{\pi}{6} = \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{3}} = \sqrt{3} + \frac{1}{\sqrt{3}}$$

$$\cot \frac{\pi}{6} + \csc \frac{\pi}{6} - \tan \frac{5\pi}{6} = \sqrt{3} + 2 - \frac{1}{\sqrt{3}} = \frac{2\sqrt{3} + 3 - 1}{\sqrt{3}} = \frac{2\sqrt{3} + 2}{\sqrt{3}}$$

$$\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{6}) = \cos(0) + \sin(\frac{\pi}{2}) = 1 + 1 = 2$$

$$f(x) = \begin{cases} x^2 + \varepsilon x & x > a \\ x^2 + a + \varepsilon & x \leq a \end{cases} \Rightarrow \begin{cases} a^2 + \varepsilon a & a > a \\ a^2 + a + \varepsilon & a \leq a \end{cases} \Rightarrow a^2 + \varepsilon a = a^2 + a + \varepsilon \Rightarrow \varepsilon a = a + \varepsilon \Rightarrow \varepsilon = \frac{a + \varepsilon}{a} \Rightarrow \varepsilon = 1 + \frac{\varepsilon}{a}$$

$$f(x) = \begin{cases} x^2 + \varepsilon x & x > 1 \\ x^2 + 1 & x \leq 1 \end{cases} \Rightarrow f(1) = (1)^2 + \varepsilon(1) = 1 + \varepsilon$$

$$f(x) = \begin{cases} rx - b & |x| \geq 1 \\ a + rx & -1 \leq x \leq 1 \end{cases}$$

$$\begin{aligned} |x| \geq 1 & \Rightarrow \begin{cases} x \geq 1 \\ x \leq -1 \end{cases} \Rightarrow \begin{cases} rx - b = a + r(-1) \\ rx - b = a + r(1) \end{cases} \\ rx - b = a - r & \Rightarrow rx - b = a + r \\ rx - b = a + r & \Rightarrow rx - b = a + r \end{aligned}$$

$$f(x) = \frac{1}{x^2 - \varepsilon x}$$

$$\begin{aligned} x^2 - \varepsilon x & \neq 0 \\ x^2 - \varepsilon x = x(x - \varepsilon) & \Rightarrow x \neq 0, x \neq \varepsilon \end{aligned}$$

$$D_f = \mathbb{R} - \{0, \varepsilon\}$$

(الف)

$$f(x) = \frac{1}{x^2 + \varepsilon x^2 + \varepsilon x + \varepsilon}$$

$$\begin{aligned} x^2 + \varepsilon x^2 + \varepsilon x + \varepsilon & \neq 0 \\ x^2 + \varepsilon x^2 + \varepsilon x + \varepsilon & \neq 0 \end{aligned}$$

$$D_f = \mathbb{R} - \{r\}$$

(ب)

$$y = \sqrt{x-1} + \sqrt{x-5} \quad x-1 \geq 0, x-5 \geq 0 \Rightarrow \begin{cases} x \geq 1 \\ x \geq 5 \end{cases} \Rightarrow x \geq 5 \Rightarrow D_f = [5, \infty) \quad \text{(الف)}$$

$$y = \sqrt{4-2x} + \sqrt{2x-5} \quad \begin{cases} 4-2x \geq 0 \\ 2x-5 \geq 0 \end{cases} \Rightarrow \begin{cases} x \leq 2 \\ x \geq \frac{5}{2} \end{cases} \Rightarrow \text{No solution} \Rightarrow D_f = \emptyset \quad \text{(ب)}$$

$$y = \sqrt{9x-a} + \sqrt{b-2x} \quad x=t \Rightarrow \begin{cases} a=12 \\ b=4 \end{cases} \Rightarrow \frac{b}{a} = \frac{4}{12} = \frac{1}{3}$$

مکافاتی که در دسترس تابعین داریم معکوس است. یعنی معکوس از رادیکال ما یا دامنه معکوس که به ازای هر عضو دامنه معکوس

$$y = \sqrt{\frac{x^2-2x-6}{x^2+2x-15}} \quad \begin{cases} x^2-2x-6 \geq 0 \\ x^2+2x-15 > 0 \end{cases} \Rightarrow \begin{cases} x \leq -2 \text{ or } x \geq 3 \\ x < -5 \text{ or } x > 3 \end{cases} \Rightarrow D_f = (-\infty, -5) \cup (-2, 3) \cup (3, \infty)$$

$$y = \sqrt{\frac{x^2-2x^2-0x+4}{x^2+2x^2-0x+4}} \Rightarrow a+b+c+d=0 \Rightarrow \begin{cases} x \leq -2 \\ x \geq 3 \end{cases} \Rightarrow D_f = (-\infty, -2] \cup [3, \infty)$$

$$y = \sqrt{2[x]-4} \quad 2[x]-4 \geq 0 \Rightarrow [x] \geq 2 \Rightarrow [x] \geq 2 \Rightarrow D_f = [2, \infty) \quad \text{(ج)}$$

$$y = \sqrt{2[x]-5} \quad 2[x]-5 \geq 0 \Rightarrow [x] \geq \frac{5}{2} \Rightarrow [x] \geq 3 \Rightarrow D_f = [3, \infty) \quad \text{(د)}$$

$$y = \sqrt{\frac{x+1}{x-1}} + \sqrt{\frac{4-x}{x^2+2x+4}} \quad \begin{cases} \frac{x+1}{x-1} \geq 0 \\ \frac{4-x}{x^2+2x+4} \geq 0 \end{cases} \Rightarrow \begin{cases} x \leq -1 \text{ or } x \geq 1 \\ x \leq 4 \end{cases} \Rightarrow D_f = [-1, 4] \cup [1, \infty)$$

$$y = \sqrt{[x]-4} + \sqrt{2-[x]} \quad \begin{cases} [x]-4 \geq 0 \\ 2-[x] \geq 0 \end{cases} \Rightarrow \begin{cases} x \geq 4 \\ x \leq 2 \end{cases} \Rightarrow \text{No solution} \Rightarrow D_f = \emptyset \quad \text{(ه)}$$