

بنظر

تلفیه شماره 1

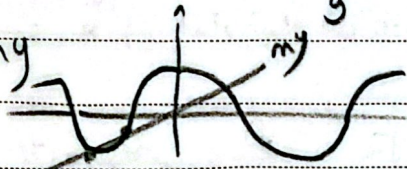
کیوان مظفر شیب

(1)

$$y''' = 2n^2 + 2n - 1 \xrightarrow{\sqrt[3]{}} y = \sqrt[3]{2n^2 + 2n - 1} \rightarrow \text{تابع است}$$

$$1) \quad n \cos y = y \cos n \rightarrow \frac{\cos y}{y} = \frac{\cos n}{n} \rightarrow 0 < \frac{\cos n}{n} < \infty$$

$$\rightarrow \cos y = my \quad \text{خط مستقیم برضورد دایره}$$



$$2) \quad \frac{n+y}{2} = \sqrt{ny} \quad n, y > 0 \quad \xleftrightarrow{\text{توان ۲}} \frac{n^2+y^2+2ny}{2} = ny \leftrightarrow n^2+y^2+2ny = 2ny$$

$$\leftrightarrow n^2+y^2-2ny = 0 \leftrightarrow (n-y)^2 = 0 \leftrightarrow n = y \quad \text{تابع است}$$

$$1) \quad ny^2 + 2n - y^3 - 2y = 0 \rightarrow y^2(n-y) + 2(n-y) = 0$$

$$\rightarrow (n-y)(y^2+2) = 0 \rightarrow n-y = 0 \rightarrow n = y \quad \text{تابع است}$$

(2)

$$|n-1| > 2 \rightarrow n-1 > 2 \rightarrow n > 3 \quad \vee \quad n-1 < -2 \rightarrow n < -1$$

$$\Rightarrow F(n) = \begin{cases} 2n^2 - b & n > 3 \vee n < -1 \\ a + 2n & -3 \leq n \leq -1 \end{cases}$$

تابع یکتا برای $n=1$ و $n=-3$ یک جواب است

$$n = -1 \rightarrow 2-b = a-2 \rightarrow a+b = 4 \quad \vee \quad n = -3 \rightarrow 1-b = a-6$$

$$\rightarrow a+b = 2 \quad \vee$$

$$a, b \rightarrow \text{نوعی عدد} \rightarrow n=a \rightarrow a-ba-a^2=0$$

(3)

$$\rightarrow a^2 + ba - a = 1 \rightarrow a(a+b-1) = 1 \rightarrow a \neq 0 \vee a+b-1=1 \rightarrow \boxed{a+b=1}$$

$$1) \quad n \neq b \rightarrow a - b^2 = b^2 \rightarrow 2b^2 = a \rightarrow b = \sqrt{\frac{a}{2}} \rightarrow \frac{\sqrt{2}}{2}a + a = 1 \rightarrow \frac{(2+\sqrt{2})a}{2} = 1$$

$$\rightarrow \text{پس } a \rightarrow \text{پس } b \rightarrow a+b=1$$

(4) باید ضریب x^2 منفی شود تا بازه $(-\infty, 2)$ معنی پیدا کند.

$$\frac{x^2}{\sqrt{-(x-2)}} \rightarrow -x+2 = bx+c-1 \quad b=-1, c=2, a=0$$

$$3a+c-3|b| = 3(0)+2-3|-1| = 2-3 = -1 \quad \checkmark$$

(5) الف) $f(x) = \sqrt[n]{\frac{1}{|x|-[x]}}$ $\rightarrow |x| - [x] \neq 0 \rightarrow |x| \neq [x]$

$\leftarrow$ x نباید عدد صحیح باشد. زیرا با هم مساوی می شوند.

باید اعداد غیر از این باز باشند.

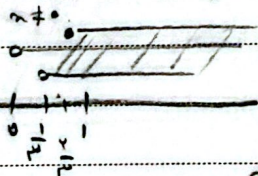
$D_f: \mathbb{R} - \mathbb{Z} \cup \{0\} \quad \checkmark$

ب) $f(x) = \sqrt{x} + \sqrt{y} = 9 \rightarrow \sqrt{y} = 9 - \sqrt{x} \quad \textcircled{1} \quad x \geq 0$

$\textcircled{2} \quad 9 - \sqrt{x} \geq 0 \xrightarrow{\text{توان 2}} \sqrt{x} \leq 9 \rightarrow x \leq 81 \quad \textcircled{D, F} \quad \boxed{0 \leq x \leq 81} \quad \checkmark$

الف) $f(x) = \sqrt{\log_{x-1} x} \quad \textcircled{1} \quad x-1 > 0 \rightarrow x > 1, \quad \textcircled{2} \quad x > 0, \quad x \neq 1$

$\textcircled{3} \rightarrow \log_{x-1} x \geq 0 \rightarrow x-1 \geq 1 \rightarrow x \geq 2 \quad \textcircled{D, F, G} \quad \left[\frac{x}{x-1} \geq +\infty\right) \quad \checkmark$



ب) $f(x) = \log \frac{1}{4 + \sqrt{|x|} - |x|} \quad \textcircled{1} \quad \frac{1}{4 + \sqrt{|x|} - |x|} > 0 \rightarrow$

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

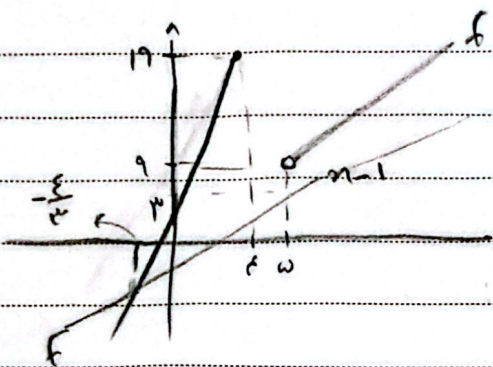
الف) $y = \sqrt{\frac{x^2+x+a}{x+b}} \rightarrow \sqrt{\frac{x^2+x+ax+ab}{x+b}} \rightarrow D_f: (r, +\infty)$

$\rightarrow \sqrt{\frac{(x+a)x + r+ab}{x+b}} \rightarrow \frac{x^2}{x+b} \quad b = -r \quad a = -r = \sqrt{\frac{r+4}{2r}}$

$\rightarrow \boxed{b = -r} \quad \checkmark$

$$f(n) = \begin{cases} n-1 & n > \omega \\ \varepsilon n + \mu & n \leq \varepsilon \end{cases}$$

(7)



$$f(n) = n+1 > \omega \rightarrow f(n) > n-1$$

$$\text{Is } f(n) = n-1 \text{ ?}$$

$$\textcircled{1} \quad n-1 = n-1 \rightarrow \text{no, } \Delta$$

$$\textcircled{2} \quad \varepsilon n + \mu = n-1$$

$$\varepsilon n = -\mu - 1 \rightarrow n = \frac{-\mu-1}{\varepsilon} \checkmark$$

$$\rightarrow D_f = \left[-\frac{\varepsilon}{\varepsilon}, \varepsilon\right] \cup (\omega, +\infty)$$

$$g = \frac{\mu(n^2 + 15n^2 + 4n + 1)}{(n+1)^2} = \frac{\mu(n+1)^2}{(n+1)^2} = \frac{\mu}{(n+1)} \rightarrow \neq$$

$$\rightarrow D_f = \mathbb{R} - \left\{-\frac{1}{\varepsilon}\right\} \checkmark$$

(9)

$$y = \sqrt{1 - \log^{n-a}} \rightarrow \textcircled{1} \quad n-a > 0 \rightarrow n > a \rightarrow a > \frac{a}{r}$$

(10)

$$\textcircled{2} \quad 1 - \log^{n-a} > 0 \rightarrow \log^{n-a} \leq 1 \rightarrow n-a \leq 1 \rightarrow n \leq \frac{1+a}{r}$$

$$\Rightarrow D_f = \left(\frac{a}{r}, \frac{1+a}{r}\right] \rightarrow c-b = \frac{1+a}{r} - \frac{a}{r} = \frac{1}{r} = \textcircled{a} \checkmark$$