

کلاسف کد ۲

۱۹,۷۵

نیاسین ساه نظری

بازدهم دعتیر

$$2x^2 + y^2 - 4x + 4y + k = 0 \quad (1)$$

برای تابی بودن تابع باید سعی کنیم عبارت را مربع کامل کنیم.

$$(2x^2 - 4x + 2) + (y^2 + 4y + 4) = 0$$

$$2(x-1)^2 + (y+2)^2 = 0$$

که در این صورت یک نقطه داریم.

$$x=1, y=-2 \rightarrow (1, -2)$$

$$k = 2 + 4 = 6$$

$$f(x) = \begin{cases} x^2 + 4x, & x \geq a \\ 2x + a + 2, & x < a \end{cases} \quad (2)$$

برای تابع بودن رابطه $x=a$ فقط باید یک جواب داشته باشد.

$$x=a \rightarrow a^2 + 4a = 2a + 2 \rightarrow a^2 + 2a - 2 = 0 \rightarrow (a+2)(a-1) = 0$$

$$a = -2 \leftarrow \text{باتوجه به شرایط سوال } (a > 0) \text{ غیر قابل قبول}$$

$$a = 1$$

$$f(1) \rightarrow x=a \rightarrow f(1) = (1)^2 + 4(1) = 5$$

$$f(x) = \begin{cases} 2x^2 - b, & |x+1| \geq 2 \rightarrow x+1 \geq 2 \rightarrow x \geq 1 \\ & \rightarrow x+1 \leq -2 \rightarrow x \leq -3 \\ a+2x, & -3 < x < 1 \end{cases} \quad (3)$$

برای تابع بودن رابطه $x=-3$ در هر دو ضابطه باید برابر بشود.

$$x=-3 \rightarrow 2(-3)^2 - b = a + 2(-3)$$

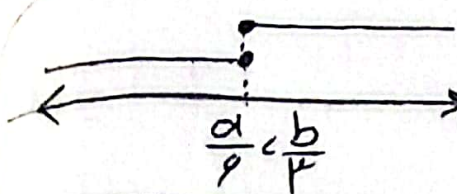
$$18 - b = a - 6 \rightarrow a + b = 24$$

$$y = \sqrt{4x-a} + \sqrt{b-4x} \quad 4x-a \geq 0 \rightarrow 4x \geq a \rightarrow x \geq \frac{a}{4} \quad (4)$$

$$b-4x \geq 0 \rightarrow 4x \leq b \rightarrow x \leq \frac{b}{4}$$

$$\frac{a}{4} = \frac{b}{4} = 2 \rightarrow b=8, a=8$$

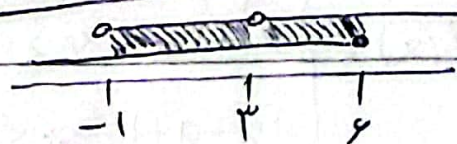
دامنه یک عدد است


 $\frac{a}{p} < \frac{b}{p}$
 $\frac{b}{a} = \frac{4}{11} = \boxed{\frac{1}{11}}$ ✓ ④

الف) $y = \sqrt{\frac{x+1}{|x-1|}} + \sqrt{\frac{4-x}{x^2+2x+1}}$ $\frac{x+1}{|x-1|} \geq 0$ ②
 $\star \rightarrow$ ملاحظة
 $\frac{-1}{-1} + \frac{1}{1} +$ (1, 1.5)
 ① $(-1, 1) \cup (1, +\infty)$

$\frac{4-x}{x^2+2x+1} \geq 0 \rightarrow 4-x \geq 0 \rightarrow$ ③ $x \leq 4$

$\Delta < 0, a > 0 \rightarrow$ عبارة
هواره مست ① ② ③ $\rightarrow D_f = [-1, 1) \cup (1, 4]$



ب) $y = \sqrt{x-1} + \sqrt{1-x}$

$[x] - 1 \geq 0 \rightarrow [x] \geq 1 \rightarrow$ ① $x \geq 1$
 $1 - [x] \geq 0 \rightarrow [x] \leq 1 \rightarrow$ ② $x \leq 1$ ① ② $\rightarrow D_f = \emptyset$

ج) $y = \sqrt{\frac{x^2-x-4}{x^2-11x^2+14}}$ $\frac{x^2-x-4}{x^2-11x^2+14} \geq 0$ ③
 $\rightarrow (x-1)(x+4)$
 $\rightarrow (x^2-9)(x^2-1)$

$\frac{(x-1)(x+4)}{(x+3)(x-3)(x+1)(x-1)} \geq 0$
 $\frac{(x+4)}{(x+3)(x-3)(x+1)}$

$D_f = (-\infty, -3) \cup (-3, 3) \cup (3, +\infty)$ ✓

	-3	-1	1	3
x^2-x-4	+	+	-	-
x^2-9	+	0	-	-
x^2-1	+	+	0	+
x^2-x-4	+	+	-	-
$(x^2-9)(x^2-1)$	+	0	-	+



جمع ضرب: معبر ← بخش نیزه (1-9)

$$y = \sqrt{\frac{x^3 - 2x^2 - 5x + 4}{x^3 + 2x^2 - 5x - 4}} \geq 0$$

جمع معادل: معادل فرار و جمع برابر ← بخش نیزه

$$\begin{array}{r|l} (x+1) & x^3 - 2x^2 - 5x + 4 \\ \hline & x^3 - x^2 \\ \hline & -x^2 - 5x + 4 \\ & -x^2 + x \\ \hline & -4x + 4 \\ & -4x + 4 \\ \hline & 0 \end{array} \quad \begin{array}{r|l} & x^3 + 2x^2 - 5x - 4 \\ \hline & x^3 + x^2 \\ \hline & x^2 - 5x - 4 \\ & x^2 + x \\ \hline & -4x - 4 \\ & -4x - 4 \\ \hline & 0 \end{array}$$

$$\frac{(x-1)(x-3)(x+2)}{(x+1)(x+3)(x-2)} \geq 0$$

	-3	-2	-1	1	2	3
$x-1$	-	-	-	0	+	+
$x^2 - x - 4$	+	+	0	-	-	0
$x+1$	-	-	-	0	+	+
$x^2 + x - 4$	+	0	-	-	-	0
$\frac{x^3 - 2x^2 - 5x + 4}{x^3 + 2x^2 - 5x - 4}$	+	0	-	0	+	0

$$D_f = (-\infty, -2) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$$

الف) $\sqrt{[-x] - 2} \quad [-x] - 2 \geq 0 \quad [-x] \geq 2$ ②

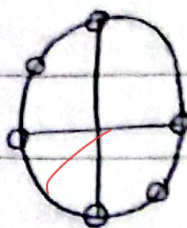
$$x \leq -2 \rightarrow D_f = (-\infty, -2]$$

ب) $\frac{\omega x^2 + 4}{[x]^2 - 2[x] - 3} \quad [x] = a$

$$a^2 - 2a - 3 \neq 0 \rightarrow (a-3)(a+1) \neq 0 \rightarrow a \neq -1, a \neq 3$$

$$D_f = \mathbb{R} - ([-1, 0) \cup [3, 4)) \quad [x] \neq -1 \rightarrow x \notin [-1, 0) \quad [x] \neq 3 \rightarrow x \notin [3, 4)$$

$\sin x \neq 0$
 ا) $y = \frac{\cot x + 1}{\tan x + 1} \rightarrow \tan x \neq -1$
 $\cos x \neq 0$

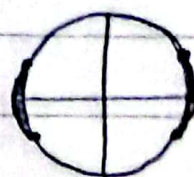


⑧

$$D_f = \mathbb{R} - \left\{ k\pi, k\pi + \frac{\pi}{4}, k\pi + \frac{3\pi}{4} \right\}$$

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ب) $y = \sqrt{1 - k \sin^2 x}$
 $1 - k \sin^2 x \geq 0$
 $k \sin^2 x \leq 1$
 $\sin^2 x \leq \frac{1}{k}$
 $-\frac{1}{\sqrt{k}} \leq \sin x \leq \frac{1}{\sqrt{k}}$



$$D_f = \left[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right]$$

ا) $y = \sqrt{1 - \log \frac{x-1}{k}}$
 $1 - \log \frac{x-1}{k} \geq 0$

⑨

$\log \frac{x-1}{k} \leq 1 \rightarrow x-1 \leq k$
 ① $x \leq k+1$

$x-1 > 0 \rightarrow x > 1$

② $x > 1 \rightarrow D_f = \left[\frac{k}{k-1}, +\infty \right)$

ب) $\frac{\sqrt{x^k - x}}{1 - \log \frac{x^k - x}{k}}$
 $x^k - x \geq 0 \rightarrow x(x-1) \geq 0$
 ① $x \in (-\infty, 0] \cup [1, +\infty)$

$1 - \log \frac{x^k - x}{k} \neq 0 \rightarrow \log \frac{x^k - x}{k} \neq 1$
 ② $x \neq -1$
 $\rightarrow x \neq k$

$x^k - x \neq k \rightarrow x^k - x - k \neq 0$
 $(x-k)(x+1) \neq 0$

$x^k - x \geq 0 \rightarrow x(x-1) \geq 0$
 $\frac{0}{k} - \frac{1}{k} + \frac{1}{k} = 0$
 ③ $x \in (-\infty, 0) \cup (k, +\infty)$

$$\textcircled{1} \cap \textcircled{2} \cap \textcircled{3} \rightarrow D_f = (-\infty, -1) \cup (-1, 0) \cup (\mu, \kappa) \cup (\kappa, +\infty)$$

$$\text{الف) } y = \sqrt{\frac{\kappa x - x^2}{\mu - 1}}$$

$$\frac{\kappa x - x^2}{\mu} - 1 \geq 0 \rightarrow \frac{\kappa x - x^2}{\mu} \geq 1$$

$$\kappa x - x^2 \geq \mu \rightarrow \kappa x - x^2 \geq \mu$$

$$D_f = [1, \mu]$$

$$\begin{array}{c} \mu \\ \hline + \phi - \phi + \end{array}$$

$$\begin{aligned} -x^2 + \kappa x - \mu &\geq 0 \\ x^2 - \kappa x + \mu &\leq 0 \\ (x - \mu)(x - 1) &\leq 0 \end{aligned}$$

$$y = \left(\frac{\kappa x + \delta}{\mu x + \kappa} \right)! \rightarrow \frac{\kappa x + \delta}{\mu x + \kappa} \in W \quad \frac{-\kappa_W + \delta}{\kappa_W - \mu} \in \mathcal{A}$$

$$D_f = \left\{ x \mid x = \frac{-\kappa k + \delta}{\mu k - \mu}, k \in W \right\}$$