

تکلیف منظمه : د <<میرزا>> لیکل شوی

الف) $f(x) = \sqrt{\frac{x-1}{x} - \frac{x}{x-1}}$ $\frac{x-1}{x} \geq \frac{x}{x-1}$ 1

150 $x^2 + 1 - 2x \geq x^2 \rightarrow 2x - 1 \leq 0 \rightarrow 2x \leq 1 \rightarrow x \leq \frac{1}{2}$
 $D_f = (-\infty, \frac{1}{2}]$ $\frac{(x-1) \leq x^2}{x(x-1)} \geq 0 \rightarrow \frac{-2x+1}{x(x-1)} \geq 0$
 باید بین علامت ها نگاه کنیم! $D_f = (-\infty, \frac{1}{2}] \cup (\frac{1}{2}, 1)$

ب) $\frac{1}{x+1} - \frac{x}{x}$ ① $x+1 \neq 0$ ② $x \neq 0$ ③ $x \neq 1$ ④ $x \neq -2$
 $\frac{x}{x-1} + \frac{1}{x+2}$

$D_f = R - \{-2, -1, 0, 1\}$ $\frac{x+2}{(x-1)(x+2)} \neq 0 \rightarrow x \neq -2$
 $\frac{x+2}{(x-1)(x+2)} = 0 \rightarrow x = -2$

الف) $f(x) = \sqrt{((\frac{1}{x})^2 - 9)(x^4 - x^2)}$ $x = -2$ $x = \frac{A}{r}$ 2

$\frac{-r}{+} | - | \frac{A}{r} +$ $D_f = R - (-2, \frac{A}{r})$ 118

ب) $\sqrt{x-1} + \sqrt{y+1} = 3$ $x \geq 1$ $D_f = [1, +\infty)$
 $\sqrt{y+1} = 3 - \sqrt{x-1} \rightarrow \sqrt{y+1} \leq 3 \rightarrow y+1 \leq 9 \rightarrow y \leq 8$

$f(x) = \log_{\frac{1}{2}}(x^2 - x - 2)$ $x^2 - x - 2 > 0$ $D_f = [1, 2] \cup [2, +\infty)$
 $\sqrt{x^2-1} + 1$ $(x-2)(x+1) > 0$ 115
 $x^2 - 1 > 0$ $x^2 > 1 \rightarrow x > 1$ $x < -1$
 $D_f = (1, +\infty)$ sam

$\rightarrow x > 2 \cup x < -1 \rightarrow D_f = (-\infty, -1) \cup (2, +\infty)$

$$f(x) = \sqrt{r+ax} \cdot x^r \quad [-r, b] \quad a+b=?$$

$$r - ra - r = 0$$

$$-1 = ra$$

$$-\frac{1}{r} = a$$

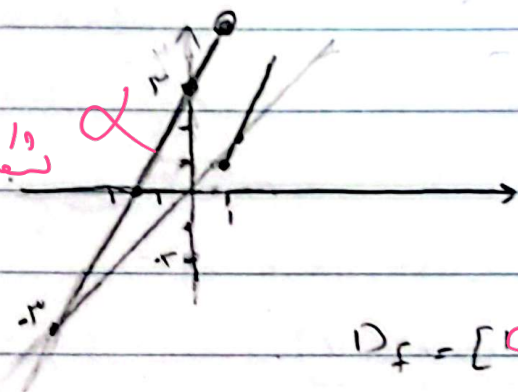
$$-x^r - \frac{1}{r}x + r$$

$$-(x^r + \frac{1}{r}x - r) \quad x^r - 5x + 9$$

$$S = -r + b = \frac{r}{r} \rightarrow b = \frac{r}{r} \quad a+b = \frac{-1}{r} + \frac{r}{r} = \boxed{1}$$

$$f(x) > x$$

نکته خطرات نه



$$rx + r = x$$

$$x = -r$$

$$rx - r = x$$

$$rx = r \rightarrow x = 1$$

$$D_f = [-r, +\infty)$$

$$f(x) = rx^r - fx \quad f\left(\frac{\sin r}{r} + \frac{\cos r}{r}\right) = f\left(\frac{r+r}{r}\right)$$

$$= rx(x-r) \quad r\left(\frac{\sqrt{r+r}}{r}\right) - r\left(\frac{\sqrt{r+r}}{r}\right) = -\frac{1}{r}$$

$$= (\sqrt{r+r}) / (\sqrt{r}-r) = r - r = \boxed{-1}$$

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

$$f(f(a)) = a$$

$$\frac{f(a)+1}{f(a)-1} = a$$

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

$$= \frac{\frac{r}{a-1}}{\frac{r}{a-1}} = a$$

$$D_f = R - \{1\}$$

به ازای هر مقدار به تمام

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

$$\frac{r}{a-1}$$

به ازای $a=1$ تعریف نشده است!

$$f(x) = x^r - fx$$

$$g(x) = \sqrt{x^r - 1}$$

$$f(g(a)) = -f$$

$$x^r - fx = -f$$

$$\sqrt{x^r - 1} = r$$

$$x^r - fx - f = 0$$

$$x^r - 1 = r$$

$$x^r = r+1 \rightarrow x = \pm \sqrt[r]{r+1} \rightarrow a = \pm \sqrt[r]{r+1}$$

$$(x-r)^r = 0 \rightarrow x=r \rightarrow g(a)=r$$

$$f(x+r) = x^r - Ax + y \quad f(\epsilon) \times f(-r) = ? = \underline{1 \leq r} \quad -9$$

$$\left. \begin{array}{l} x+r=1 \\ x=1 \end{array} \right\} f(\epsilon) = 1 - A + y = \underline{r}$$

$$\left. \begin{array}{l} x+r=-r \\ x=-y \end{array} \right\} f(-r) = r^y + r_0 + y$$

$$\boxed{f(-r) = Vr}$$

$$P(r \cos^r x + A \cos x) = \tan^r x \quad f(r, A) = ? \quad -10$$

$$\tan^r x = 1 = \frac{1}{\cos^r x}$$

$$\tan^r x = \frac{\cos^r x}{\cos^r x} = 1$$

$$r \cos^r x + A \cos x = r, A$$

$$r \cos^r x + A \cos x - r, A = 0$$

$$\cos^r x + A \cos x - 1/r = 0$$

$$\underbrace{(\cos^r x - r)}_{\frac{r}{r} = 1} \underbrace{(\cos x + V)}_{\frac{V}{r}} = 0$$

$$\tan^r x = \frac{1}{1} = 1 \quad -1 - \underline{r}$$

$$\tan^r x = \frac{1}{\frac{1}{r}} = r$$

(الف-۱) $\frac{x-1}{x} - \frac{x}{x-1} \geq 0 \rightarrow \frac{(x-1)^2 - x^2}{x(x-1)} \geq 0 \rightarrow \frac{-2x+1}{x(x-1)} \geq 0$

$\frac{1}{x} - \frac{1}{x-1} \geq 0 \rightarrow D_f = (-\infty, 0) \cup [\frac{1}{2}, 1)$

تقریباً همه مخرج‌ها نباید در دامنه باشند!

(ب-۱) $x+1 \neq 0 \rightarrow x \neq -1$, $x \neq 0$, $x-1 \neq 0 \rightarrow x \neq 1$, $x+2 \neq 0 \rightarrow x \neq -2$, $\frac{3}{x-1} + \frac{1}{x+2} \neq 0 \rightarrow \frac{3x+4+x-1}{(x-1)(x+2)} \neq 0 \rightarrow 4x+3 \neq 0 \rightarrow x \neq -\frac{3}{4}$

$D_f = \mathbb{R} - \left\{ -1, 0, 1, -2, -\frac{3}{4} \right\}$

(ب-۲) $\sqrt{x-1} + \sqrt{y+1} = 3$, $\sqrt{y+1} = 3 - \sqrt{x-1} \rightarrow 3 - \sqrt{x-1} \geq 0 \rightarrow \sqrt{x-1} \leq 3 \rightarrow x \leq 10$

$\downarrow$
 $x-1 \geq 0 \rightarrow x \geq 1$ I

I, II $\rightarrow 1 \leq x \leq 10 \rightarrow D_f = [1, 10]$

۳- $\log_{\epsilon} x^2 - x - 2 \rightarrow x^2 - x - 2 > 0 \rightarrow (x-2)(x+1) > 0$, $\frac{-1}{2} < x < 1$ I

$\sqrt{x^2-1} + 1 \rightarrow \sqrt{x^2-1} \geq 0 \rightarrow x^2-1 \geq 0 \rightarrow x \geq 1$ II

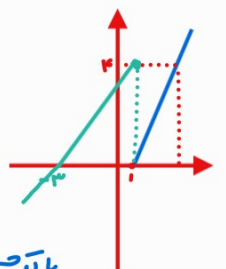
I, II $\rightarrow x < -1$, $x > 2 \rightarrow D_f = (-\infty, -1) \cup (2, +\infty)$

$f(n) - n = \begin{cases} 3n-2-n & n \geq 1 \\ n+3-n & n < 1 \end{cases} = \begin{cases} 2n-2 & n \geq 1 \\ 3 & n < 1 \end{cases}$

$f(n) - n \geq 0 \rightarrow \begin{cases} 2n-2 \geq 0 \rightarrow n \geq 1 \checkmark \\ n+3 \geq 0 \xrightarrow{n < 1} -3 \leq n < 1 \checkmark \end{cases}$

$\rightarrow D_f = [-3, +\infty)$

با توجه به شکل نیز مشخص است!



$$f(n) = 2^n - 2n = 2^n - 2n + 2 - 2 = 2(n^2 - 2n + 1) - 2 = 2(n-1)^2 - 2 \quad -4$$

$$\sin \frac{\pi}{r} + \cos r\pi = \sqrt{\frac{r}{r}} + 1 \rightarrow f(\sqrt{\frac{r}{r}} + 1) = 2(\sqrt{\frac{r}{r}} + 1 - 1)^2 - 2 = 2(\frac{r}{r}) - 2 = -\frac{1}{r}$$

$$f(f(a)) = \frac{f(a)+1}{f(a)-1} = a \rightarrow \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{\frac{a+1+a-1}{a-1}}{\frac{a+1-a+1}{a-1}} = \frac{2a}{2} = a \quad -V$$

$$x \in D_f \rightarrow x \in \mathbb{R} - \{1\}$$

پس به ازای تمامی نقاط در دامنه f بهتر است ✓