

سوال (۱)

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

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$$\text{ب) } \frac{\frac{-(x+2)}{(x-1)(x+1)}}{\frac{x+2}{(x-1)(x+1)}} \rightarrow \frac{-(x+2)}{x(x+1)} \Rightarrow \begin{cases} D_f: IR - \{-1, 0, \frac{2}{x}\} \\ D_f = IR - \{-1, -1, 0, -2, -\frac{2}{2}\} \end{cases}$$

چون چرا ادر ۲- زیادت زنده

سوال (۲)

$$\text{الف) } \frac{-x}{x+1} - \frac{x}{x-1} \geq 0 \rightarrow D_f \Rightarrow (-\infty, -1) \cup [\frac{2}{3}, \infty)$$

$$\text{ب) } \sqrt{y+1} = 3 - \sqrt{x-1} \rightarrow \sqrt{x-1} \geq 0 \rightarrow x-1 \geq 0 \rightarrow x \geq 1$$

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$$D_f = [1, \infty)$$

سوال (۳)

$$\frac{x^2 - x - 2}{(x-2)(x+1)} \geq 0 \rightarrow \frac{-1}{x-2} + \frac{2}{x+1} \geq 0 \rightarrow D_f \Rightarrow (-\infty, -1) \cup (2, \infty)$$

$$\sqrt{x^2 - 1} \geq 0 \rightarrow \frac{-1}{x-1} + \frac{1}{x+1} \geq 0 \rightarrow D_f \Rightarrow (-\infty, -1] \cup [1, \infty)$$

$$D_f \Rightarrow (-\infty, -1) \cup (2, \infty)$$

سوال (۴)

$$\begin{aligned} -x &\rightarrow \frac{1}{x}, \quad 3 - 2a - x = 0 \rightarrow a = \frac{-1}{x} \\ f(x) &= \sqrt{-x^2 - \frac{1}{x}x + 3} \Rightarrow x = \frac{\frac{1}{x} \pm \sqrt{\frac{1}{x^2} + 12}}{-2} \Rightarrow \frac{\frac{1}{x} \pm \frac{\sqrt{12x^2 + 1}}{x}}{-2} \Rightarrow -\frac{1}{2} \pm \frac{\sqrt{12x^2 + 1}}{2x} \rightarrow b \\ +\frac{x}{x} - \frac{1}{x} &\Rightarrow +1 \end{aligned}$$

$$\text{①} \rightarrow x-2 \leq 1 \rightarrow \sqrt{x-2} \geq 0 \rightarrow x-2 \geq 0 \rightarrow x \geq 2 \rightarrow \text{I} \cap \text{I} \rightarrow x \geq 2 \text{ (A)}$$

$$\text{②} \rightarrow x+3 \leq 1 \rightarrow \sqrt{x+3} \geq 0 \rightarrow x+3 \geq 0 \rightarrow x \geq -3 \rightarrow \text{I}' \cap \text{I}' \rightarrow -3 \leq x < 1 \text{ (B)}$$

$$A \cup B \rightarrow [-3, \infty)$$

$$\left(\sin(60) + \cos(360) \right) \rightarrow \frac{1+\sqrt{3}}{2} = x$$

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$$x(x-1) \rightarrow (1+\sqrt{3})\left(\frac{\sqrt{3}-1}{2}\right) \rightarrow \sqrt{3}-1+\frac{\sqrt{3}-1}{2} = -\frac{1}{2}$$

$$f(n) = \frac{n+1}{n-1} \quad f(f(n)) = a \rightarrow f\left(\frac{a+1}{a-1}\right) = a \Rightarrow$$

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$$\frac{\frac{a+1}{a-1} + \frac{a-1}{a-1}}{\frac{a+1}{a-1} - \frac{a-1}{a-1}} \Rightarrow \frac{\frac{2a}{a-1}}{\frac{2}{a-1}} = a = a = \mathbb{R}, a \neq 1$$

$$f(t) = -t \rightarrow t^2 - ft + t = 0 \xrightarrow{t=1} t=1$$

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$$g(a) = 2 \rightarrow x^2 - 1 = 2 \rightarrow x = \pm\sqrt{3}$$

$$f(x+3) = x^2 - 2x + 4 \Rightarrow f(x) \times f(-3) = ?$$

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$$\begin{aligned} x+3=1 &\rightarrow x=-2 \rightarrow 1-2+4 \rightarrow f(1)=2 \\ x+3=-3 &\rightarrow x=-6 \rightarrow 36+12+4 \rightarrow f(-3)=52 \end{aligned} \quad \left\{ \begin{aligned} f(1) \times f(-3) &= 104 \end{aligned} \right.$$

$$r \cos^2 \alpha + 2 \cos \alpha - r = 0$$

$$\cos^2 \alpha + 2 \cos \alpha - r = 0$$

$$(\cos \alpha - r)(\cos \alpha + 2) = 0$$

$$\cos \alpha = \frac{r}{2} \quad \cos \alpha = -2$$

$$\tan^2 \alpha \Rightarrow \left(\frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} \right)^2 \Rightarrow 3$$

تقریباً های مفرج ها نباید در دامنه باشند! $x+1 \neq 0 \rightarrow x \neq -1$ $x \neq 0$ $x-1 \neq 0 \rightarrow x \neq 1$

$$x+2 \neq 0 \rightarrow x \neq -2 \quad \frac{x}{x-1} + \frac{1}{x+2} \neq 0 \rightarrow \frac{x^2+2x-1}{(x-1)(x+2)} \neq 0 \rightarrow x^2+2x-1 \neq 0 \rightarrow x \neq \frac{-2 \pm \sqrt{4+4}}{2}$$

$$Df = \mathbb{R} - \left\{ -1, 0, 1, -2, -\frac{1}{2} \right\}$$