

سؤال (۱)

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

$$\text{ب) } \frac{\frac{-(x+2)}{(x-1)(x+1)}}{\frac{x+3}{(x-1)(x+2)}} \rightarrow \frac{-(x+2)(x-1)}{x(x+1)(x+3)} \Rightarrow D_f \cap \mathbb{R} = \{-1, 0, \frac{3}{2}\}$$

سؤال (۲)

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

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

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

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

سؤال (۳)

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

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

سؤال (۴)

$$-x \xrightarrow{+2} 3 - 2a - x = 0 \rightarrow a = \frac{-1}{2}$$

$$f(x) = \sqrt{-x^2 - \frac{1}{2}x + 3} \Rightarrow x = \frac{\frac{1}{2} \pm \sqrt{\frac{1}{4} + 12}}{-2} \Rightarrow \frac{\frac{1}{2} \pm \frac{\sqrt{49}}{2}}{-2} \Rightarrow -2 \pm \frac{7}{2}$$

$$+\frac{7}{2} - \frac{1}{2} \xrightarrow{a+b} +3$$

$$\textcircled{1} \rightarrow x-2 \in \mathbb{I} \rightarrow \sqrt{x^2 - x} \rightarrow x-2 \geq 0 \rightarrow x \geq 2 \xrightarrow{\mathbb{I} \cap \mathbb{I}} x \geq 2 \textcircled{A}$$

$$\textcircled{2} \rightarrow x+3 \in \mathbb{I}' \rightarrow \sqrt{x^2 + 3 - x} \rightarrow x+3 \geq 0 \rightarrow x \geq -3 \xrightarrow{\mathbb{I}' \cap \mathbb{I}'} -3 \leq x < 1 \textcircled{B}$$

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

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

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

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

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

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

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

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

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$$\begin{aligned} x+r &= x \rightarrow x=1 \rightarrow 1-2+4 \rightarrow f(1)=3 \\ x+r &= -x \rightarrow x=-4 \rightarrow 16+8+4 \rightarrow f(-4)=28 \end{aligned} \quad \left\{ \begin{aligned} f(x) \times f(-x) &= 14x \end{aligned} \right.$$

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

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

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

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

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

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