

الف) $f(x) = \sqrt{\frac{x^2 - 2x + 1}{x(x-1)}} \geq 0$ $\frac{0}{+} - \frac{+}{-} + \frac{+}{+} = \Rightarrow Df = (-\infty, 0) \cup [\frac{1}{2}, +\infty)$

ب) $f(x) = \left(\frac{x^2 - 2x + 1}{x(x-1)} \right)^{\frac{1}{2}} = \frac{(x-1)^2}{x(x-1)} = \frac{x-1}{x}$ $\frac{0}{-} - \frac{+}{-} + \frac{+}{+} = \Rightarrow Df = \mathbb{R} - \{0, -1, -\frac{1}{2}\}$

الف) $f(x) = \sqrt{(x^2 - 3x)(x^2 - 2x)} \geq 0$ $\frac{-}{+} - \frac{+}{-} + \frac{+}{+} = \Rightarrow Df = (-\infty, -2] \cup [\frac{2}{3}, +\infty)$

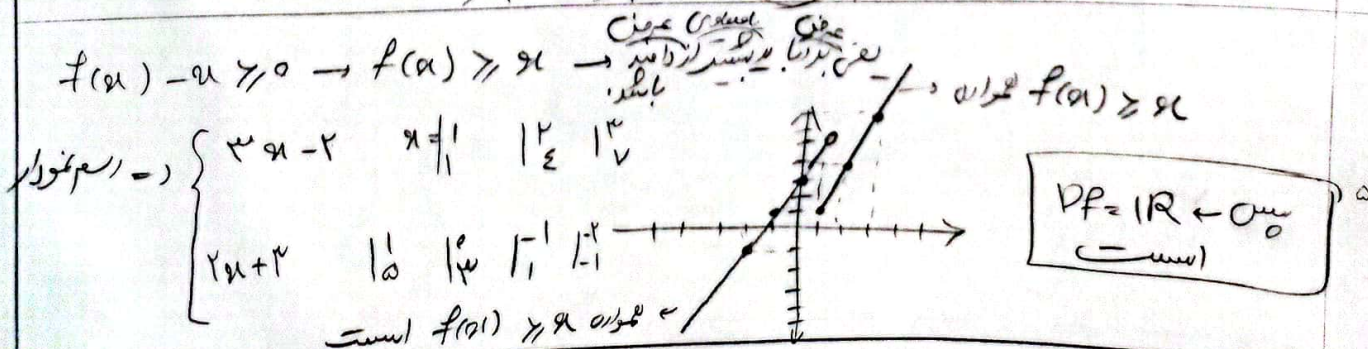
ب) $(\sqrt{x-1} + \sqrt{y+1} = 3)^2 \Rightarrow \sqrt{x-1} + y + 1 = 3 \Rightarrow y = -\sqrt{x-1} + 2$ $x-1 \geq 0 \Rightarrow x \geq 1$

$f(x) = \log_{\frac{1}{2}}(x^2 - x - 2) > 0 \Rightarrow x = -2 \text{ و } x = 1$ $\frac{-}{+} - \frac{+}{-} + \frac{+}{+} = \Rightarrow Df = (-\infty, -2) \cup (1, +\infty)$

$\sqrt{x^2 - 1} + 1 \neq 0 \Rightarrow \sqrt{x^2 - 1} \neq -1$ $x^2 - 1 \geq 0 \Rightarrow (x-1)(x+1) \geq 0 \Rightarrow x \leq -1 \text{ یا } x \geq 1$ $Df = D_1 \cap D_2 \Rightarrow (-\infty, -2) \cup (1, +\infty)$

$3 - 2a - \varepsilon = 0 \Rightarrow 2a = 3 - \varepsilon \Rightarrow a = \frac{3 - \varepsilon}{2}$

$(3 - \frac{1}{2}x - x^2)^{x^2} \geq 0 \Rightarrow -2x^2 - x + 6 \geq 0$ $x^2 - x - 12 \leq 0$ $(x-4)(x+3) \leq 0 \Rightarrow x \in [-3, 4]$ $a + b = \frac{3}{2} - \frac{1}{2} = 1$



$$f(\omega) \Rightarrow (a+1) \left(\frac{1}{a+1} \right) \Rightarrow Va + V$$

$$f(-1) \Rightarrow Va - 1$$

$$V(Va + V) = Va - 1 + a$$

$$Va + 1 = Va - 1 \Rightarrow 1 = -1 \Rightarrow a = \frac{-1}{1} = \boxed{\frac{-9}{10}}$$

$$f(1 - \sqrt{3}) \Rightarrow \sqrt{1 - \sqrt{3}} = \sqrt{\frac{1 - \sqrt{3}}{2}} = \frac{(1 - \sqrt{3})}{\sqrt{2}} = \frac{\sqrt{3} - 1}{\sqrt{2}}$$

$$f(1 + \sqrt{3}) \Rightarrow \sqrt{1 + \sqrt{3}} = \sqrt{\frac{1 + \sqrt{3}}{2}} = \frac{\sqrt{3} + 1}{\sqrt{2}}$$

$$\frac{\sqrt{3} - 1}{\sqrt{2}} + \frac{\sqrt{3} + 1}{\sqrt{2}} + \frac{\sqrt{3} + 1}{\sqrt{2}} + \frac{\sqrt{3} + 1}{\sqrt{2}} + \dots = \frac{4(\sqrt{3} + 1)}{\sqrt{2}} = 2\sqrt{2}(\sqrt{3} + 1)$$

$$\begin{cases} f(x) - 3f(-x) = 4x^2 - 2x \\ -3f(x) + 2f(-x) = 5x^2 + 2x \end{cases} \Rightarrow \begin{cases} 4f(x) - 9f(-x) = 12x^2 - 4x \\ -4f(x) + 5f(-x) = 15x^2 + 4x \end{cases}$$

$$-2f(-x) = 10x^2 - 4x \Rightarrow f(-x) = -5x^2 + 2x \Rightarrow f(x) = -5x^2 + \frac{1}{2}x$$

$$x=0 \Rightarrow (1f(0) = 9m-1) \times 1 \Rightarrow 4f(0) = 9m-1$$

$$x=-1 \Rightarrow 4f(0) = 9m+1 \Rightarrow 9m-1 = 9m+1 \Rightarrow 9m = 2 \Rightarrow m = \frac{2}{9}$$

$$4f(0) = (1 \times \frac{2}{9}) - \frac{1}{2} = \frac{2V-1}{2} = \frac{2V}{2}$$

$$f(0) = \frac{2V}{4} = \frac{V}{2}$$

$$x=-1 \quad f(-1) + f(-1) = \frac{1 + 1 + 1}{-1} = -3$$

$$4f(-1) = -11$$

$$f(-1) = -\frac{11}{4}$$