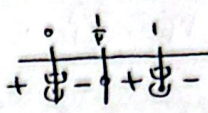
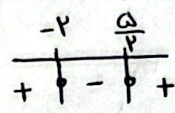


الف) $\frac{x-1}{x} - \frac{x}{x-1} \geq 0 \leadsto \frac{(x-1)^2 - x^2}{x(x-1)} \geq 0 \rightarrow \frac{1-2x}{x(x-1)} \geq 0$  $D_f = (-\infty, 0) \cup (\frac{1}{2}, 1)$

$\hookrightarrow D_f = (-\infty, 0) \cup (\frac{1}{2}, 1)$

ب) $\frac{1}{x+1} - \frac{2}{x} \leadsto x \neq 0, -1$
 $\frac{2}{x-1} + \frac{1}{x+2} \leadsto x \neq 1, -2$ لی مخرج $3x+4+x-1 = 4x+3 \neq 0 \rightarrow x \neq -\frac{3}{4}$

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

الف) $(\frac{1}{x})^2 - 9 \geq 0 \rightarrow x = \frac{\Delta}{f}$  $D_f = (-\infty, -2] \cup [\frac{\Delta}{f}, +\infty)$

$x = -2$

ب) $\sqrt[4]{x-1} + \sqrt{y+1} = 3 \leadsto \sqrt{y+1} = 3 - \sqrt[4]{x-1}$
 $x-1 \geq 0 \hookrightarrow x \geq 1$
 $\hookrightarrow \sqrt{y+1} = 3 - \sqrt[4]{x-1} \geq 0 \hookrightarrow x-1 \leq 1 \rightarrow x \leq 2$ $D_f = [1, 2]$

1 $x^2 - x - 2 > 0 \rightarrow (x+1)(x-2) > 0$ (I)
 $x < -1$ $x > 2$

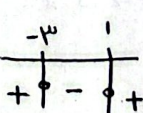
2 $x^2 - 1 > 0 \rightarrow x < -1$ و $x > 1$ (II)

$(I) \cap (II) \Rightarrow D_f = (-\infty, -1) \cup (2, +\infty)$

$\star x = -2 \rightarrow 3 - 2a - f = 0 \rightarrow a = \frac{1}{f}$ $-x^2 - \frac{1}{f}x + 3 \geq 0$ $\Delta = \frac{1}{f^2} + 12 = \frac{f^2 + 12}{f^2}$

$\hookrightarrow \bar{w}: x = \frac{\frac{1}{f} \pm \sqrt{\frac{f^2 + 12}{f^2}}}{-2} = \frac{-\frac{1}{f} \pm \frac{\sqrt{f^2 + 12}}{f}}{-2}$

$b = \frac{3}{f} \leadsto a+b=1 \quad \frac{1}{f} + \frac{3}{f} = \frac{4}{f}$

$f(x) \begin{cases} 3x-2 \geq x \leadsto x \geq 1 \checkmark \\ 2x+3 = x \leadsto x = -3 \checkmark \\ f(x) - x \geq 0 \leadsto (x < 1) \end{cases}$  $D_f = [-3, +\infty)$

جوابه برقرار $3x-2 \geq x$

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

$$\bullet f\left(\sin\frac{\sqrt{p}}{p} + \cos\frac{\sqrt{p}}{p}\right) = f\left(1 + \frac{\sqrt{p}}{p}\right)$$

$$\rightarrow p\left(1 + \frac{\sqrt{p}}{p}\right)^p - p - \sqrt{p} = \frac{-1}{p}$$

6

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

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

$$\frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = a \rightarrow \frac{\frac{2a}{a-1}}{\frac{2}{a-1}} = a \rightarrow a = \mathbb{R} - \{1\}$$

$$(a \neq 1)$$

7

$$\star f(\sqrt{a^2-1}) = -f \rightarrow a^2-1 - f\sqrt{a^2-1} = -f$$

$$f(x) = x^2 - fx, g(x) = \sqrt{x^2-1}$$

$$f(g(a))$$

$$(\sqrt{a^2-1} - f)^2 = 0 \rightarrow a = \pm\sqrt{a}$$

8

$$f(f) = 1 - \omega + f = p$$

$$f(f) = p + p_0 + f = vp$$

$$\left. \begin{array}{l} f(f) = 1 - \omega + f = p \\ f(f) = p + p_0 + f = vp \end{array} \right\} f(f) \times f(f) = p \times vp = \boxed{1ff}$$

$$x \begin{cases} x+p=f \rightarrow x=1 \\ x+p=-p \rightarrow x=-f \end{cases}$$

9

$$\bullet f \cos^2 x + \omega \cos x - p_1 \omega = 0 \rightarrow \Delta = 11 \rightarrow \cos x = \frac{-\omega \pm 9}{1} = \frac{1}{p} \sqrt{55}$$

$$\rightarrow \frac{-\sqrt{55} \cos x}{f} \rightarrow -1, \sqrt{55}$$

و در بازه $[-1, 1]$ نیست

$$\star \cos^2 x = \frac{1}{p} \rightarrow \tan^2 x = p \Rightarrow \boxed{f_{p, \omega} = p}$$

$$p_{00}, f_0$$

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