

ب)

الف) $\frac{x-1}{x} - \frac{x}{x-1} \geq 0$

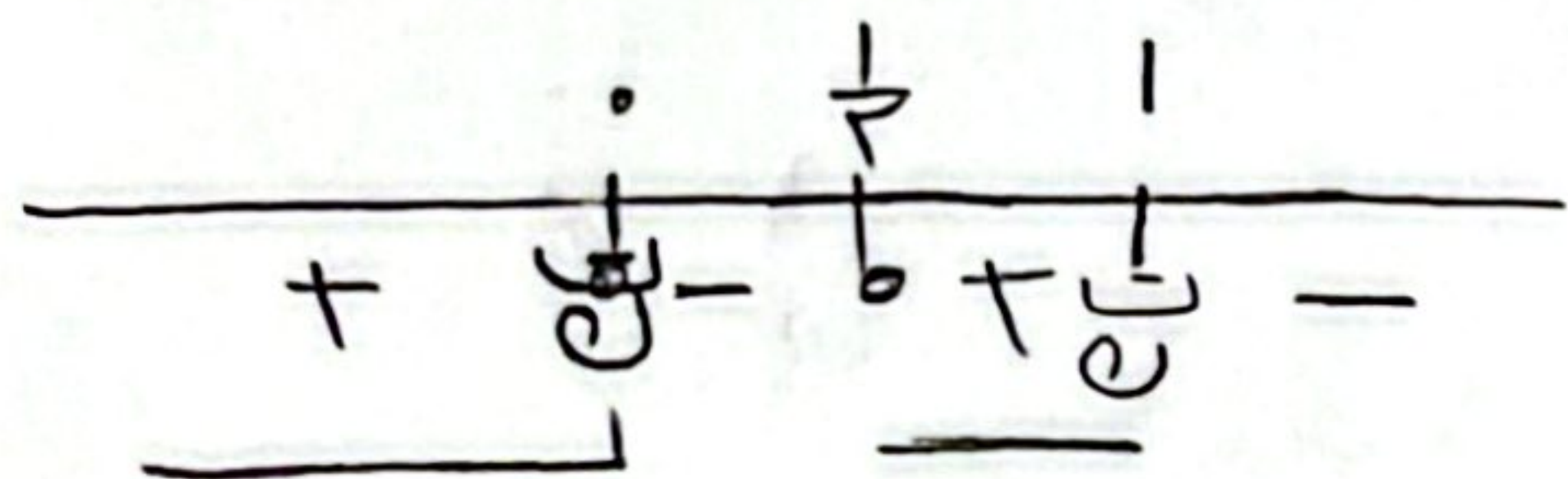
$x \neq 0, x \neq -1$

$x \neq 1, x \neq -2$

$\frac{x^2+1-2x-x^2}{x(x-1)} \geq 0 \quad x = \frac{1}{x}, 0, 1$

$\frac{3}{x-1} + \frac{1}{x+2} \neq 0 \rightarrow \frac{4x+5}{(x-1)(x+2)} \neq 0$

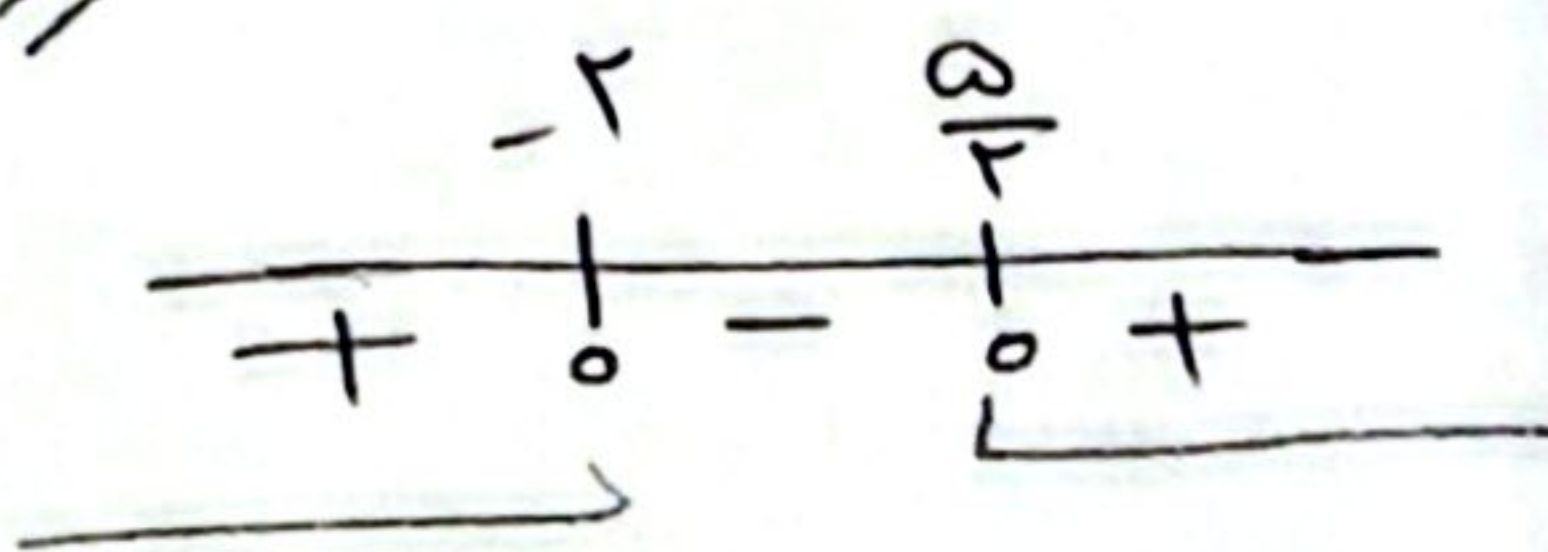
$x \neq 1, -2, -\frac{5}{4}$



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

$D_f = \mathbb{R} - \{-2, -1, 0, 1, -\frac{5}{4}\}$

الف) $((\frac{1}{x})^2 - 9)(3 - \sqrt{x-1}) \geq 0$
 $x = -2 \rightarrow 9 - 9 = 0$
 $x = \frac{5}{4}$



$D_f = (-\infty, -2] \cup [\frac{5}{4}, +\infty)$

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

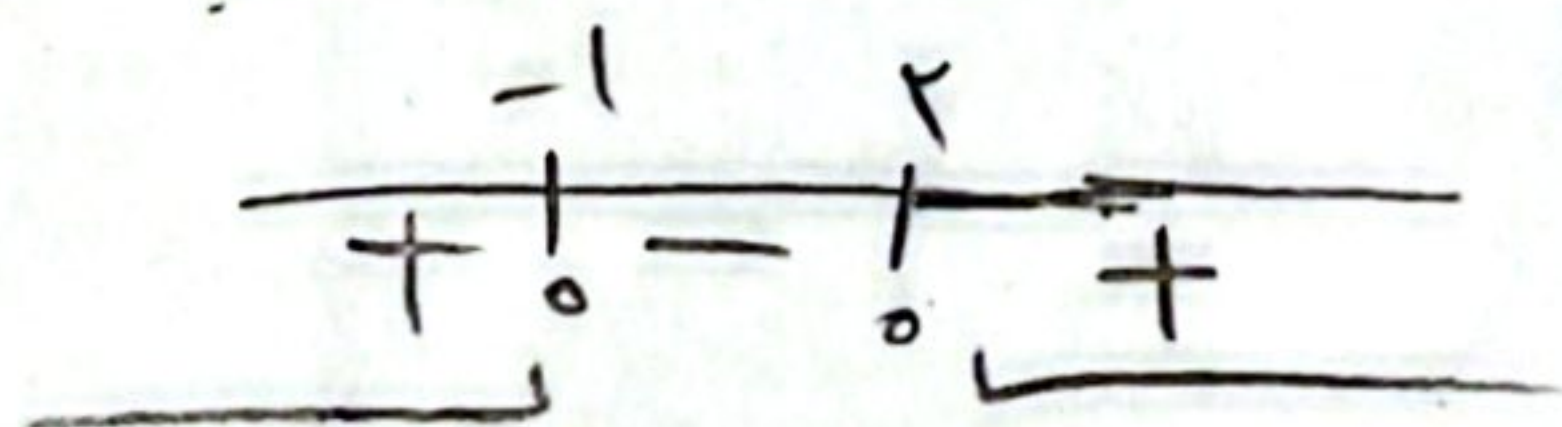
$D_f = [1, +\infty)$

$x-1 \geq 0$
 $x \geq 1$

$x^2 \geq 1$

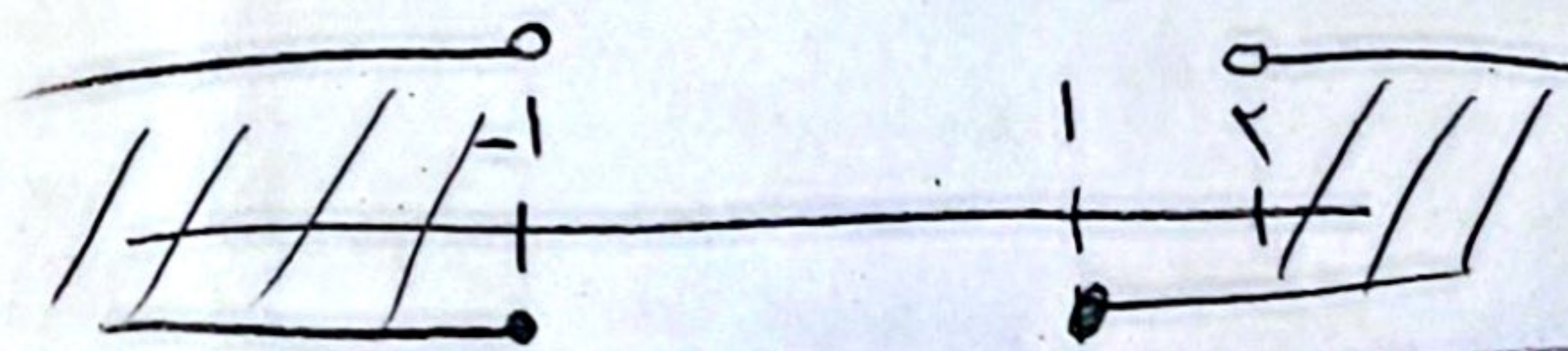
$x \geq 1$
 $x \leq -1$

$x^2 - x - 2 > 0$
 $(x-2)(x+1) > 0$



$D_f = (-\infty, -1) \cup (2, +\infty)$

اشتراک بگیر:



$3 - 2a - 6 = 0 \rightarrow f(x) = \sqrt{3 - \frac{x}{2} - x^2}$
 $a = -\frac{1}{2}$
 $-(x+2)(x-\frac{3}{2})$

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

$b = \frac{3}{2}$

۴

$$f(x) - x \geq 0 \xrightarrow{x \geq 1} \begin{cases} 2x - 2 - x \geq 0 \\ 2x - 2 \geq 0 \\ x \geq 1 \end{cases} \longrightarrow x \geq 1$$

$$\swarrow x < 1 \quad \begin{cases} 2x - \pi + 2 \geq 0 \\ x \geq -2 \end{cases} \longrightarrow -2 \leq x < 1$$

$$D_g = [-2, +\infty)$$

$$\sin \frac{\pi}{2} + \cos 2\pi = \frac{\sqrt{3}}{2} + 1 = \frac{2 + \sqrt{3}}{2}$$

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

$$f\left(\frac{a+1}{a-1}\right) = a \longrightarrow \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{2a}{2} = a$$

$$\xrightarrow{a-1 \neq 0} \frac{2}{a-1} \neq 0$$

$$a \in \mathbb{R} - \{1\}$$

↓
مهماره برابر صفر نشیت

$$f(\underbrace{\sqrt{a^2-1}}_x) = -1 \longrightarrow \begin{cases} x^2 - 1x + 1 = 0 \\ (x-1)^2 = 0 \end{cases}$$

$$\left(\sqrt{a^2-1} = 1\right) \xrightarrow{x=1} \begin{cases} a^2 - 1 = 1 \\ a^2 = 2 \\ a = \pm\sqrt{2} \end{cases}$$

$$x = -1 \longrightarrow f(-1) = \frac{3}{2} + \frac{1}{2} + 1 = \sqrt{2} \quad \left. \vphantom{f(-1)} \right\} \sqrt{2} \times 2 = 1 \neq f$$

$$x = 1 \longrightarrow f(1) = 1 - 2 + 1 = 0$$

$$f(\cos^2 + 2\cos - \frac{1}{2}) = 0 \quad \cos x = \frac{-2 \pm 1}{1} \quad \begin{cases} -\frac{1}{2} < -1 \leq \cos \leq 1 \\ \frac{1}{2} \checkmark \end{cases} \xrightarrow{\tan x = \pm \sqrt{3}} x = \frac{\pi}{3}, \frac{2\pi}{3} \dots$$

$$\Delta = 4 + 2 = 6 \xrightarrow{\sqrt{\Delta}} 2$$

$$\text{جواب} = (\sqrt{3})^2 = 3$$