

الف) $\frac{x-1}{x} - \frac{x}{x-1} \geq 0$ ۱۹، ۵ آزمین ب

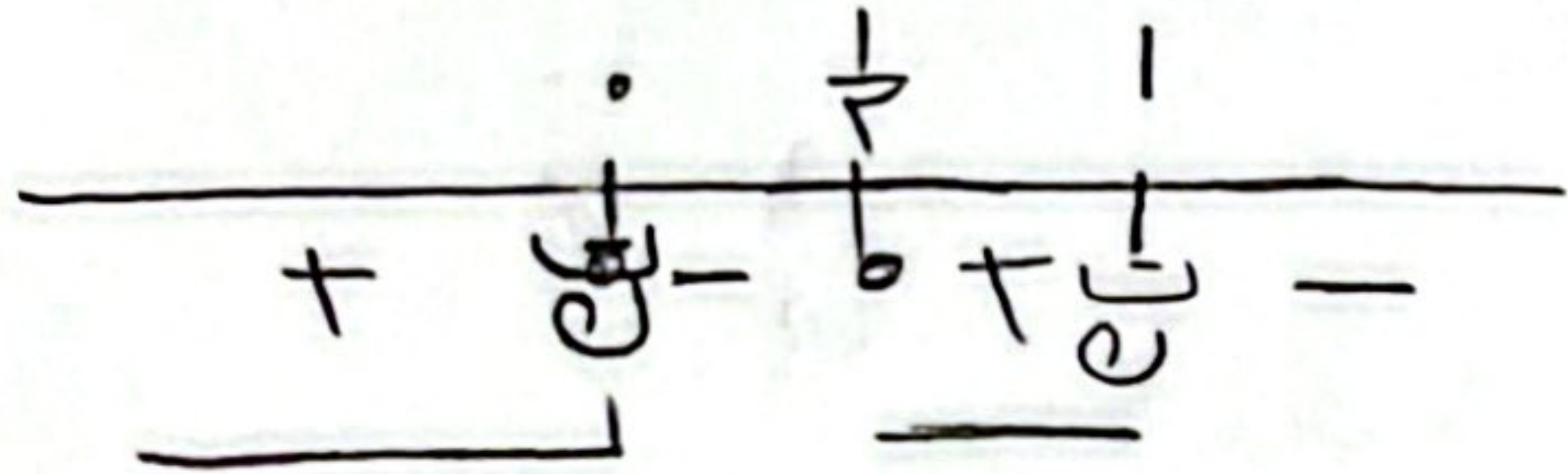
$x \neq 0, x \neq -1$

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

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

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

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

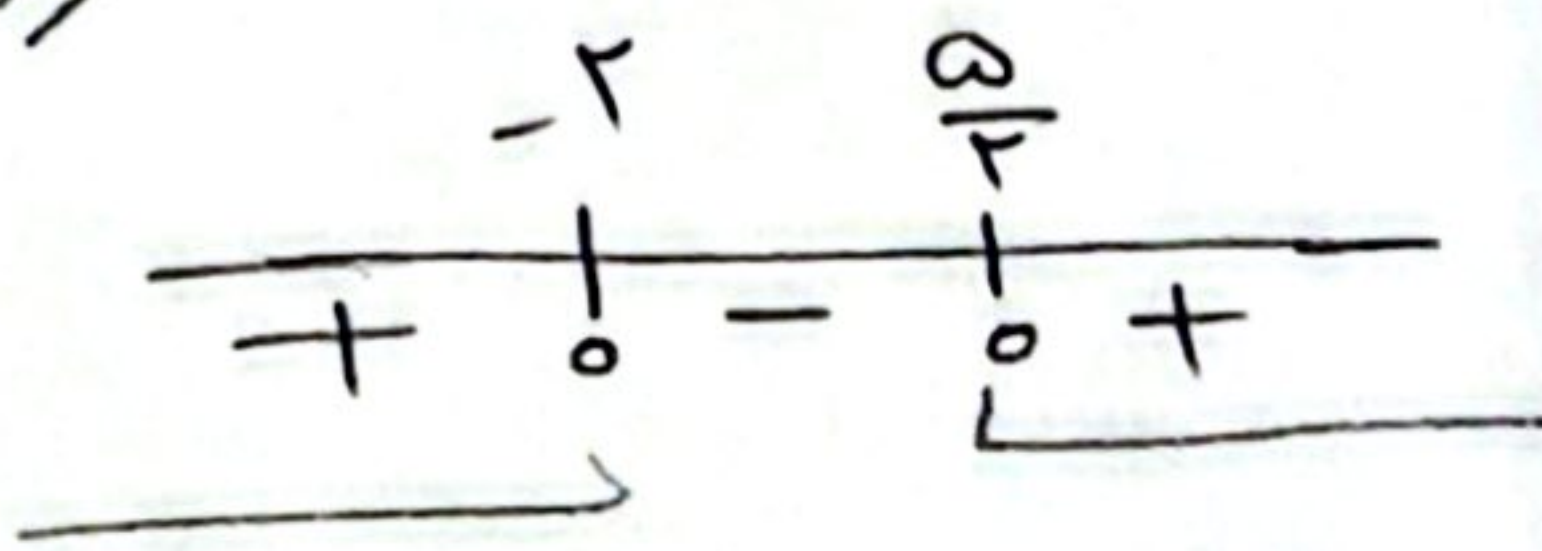


$D_f = (-\infty, 0) \cup [\frac{1}{2}, 1)$

۲

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

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

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

$\sqrt{y+1} = 3 - \sqrt{x-1} \rightarrow$ باید عددی داشته باشد! $\rightarrow \sqrt{x-1} \leq 3 \rightarrow x-1 \leq 9 \rightarrow x \leq 10$

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

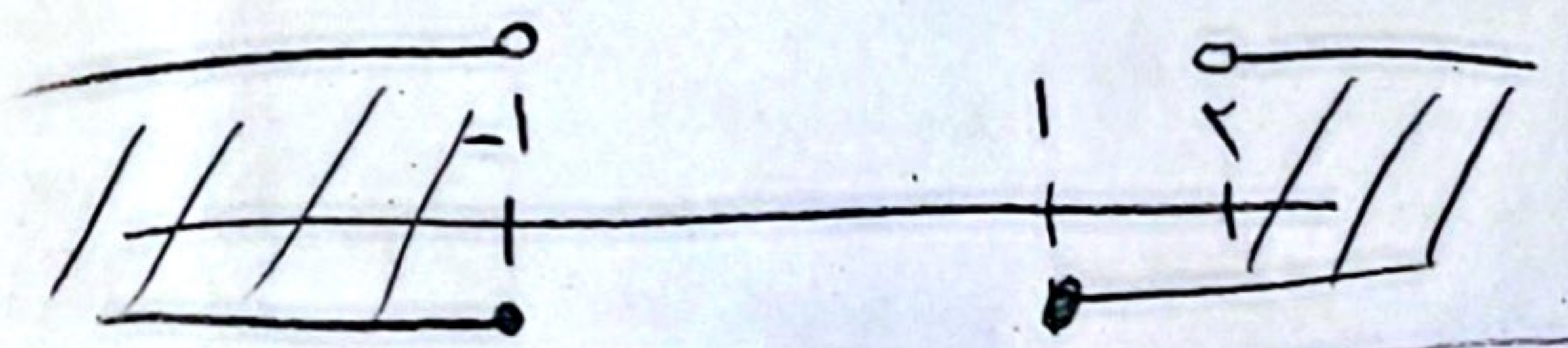
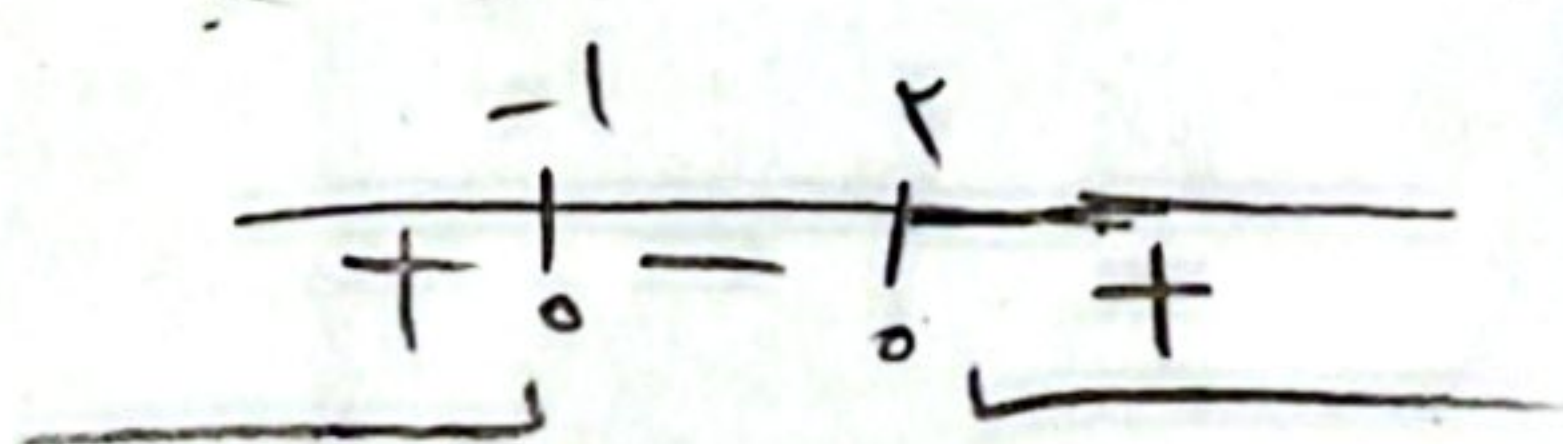
$D_f = [1, 10]$

اشتراک بگیر:

$x^2 \geq 1$

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

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



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

$3 - 2a - 5 = 0 \rightarrow f(x) = \sqrt{3 - \frac{x}{2} - x^2}$
 $a = -\frac{1}{2}$
 $-(x+2)(x-\frac{3}{2})$

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

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

۲

۴

$$f(x) - x \geq 0 \xrightarrow{x \geq 1} 2x - 2 - x \geq 0 \rightarrow x \geq 1$$

$$2x - 2 \geq 0$$

$$x \geq 1$$

$$x < 1 \rightarrow 2x - \pi + 3 \geq 0 \rightarrow -3 \leq x < 1$$

$$x \geq -3$$

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

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

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

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

$$\frac{a+1}{a-1} - 1 \neq 0 \rightarrow \frac{2}{a-1} \neq 0$$

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

مقامه برابر صفر نیست

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

$$(x - 1)^2 = 0$$

$$\left(\sqrt{a^2 - 1} = 1\right)^2 \rightarrow a^2 - 1 = 1$$

$$a^2 = 2$$

$$a = \pm \sqrt{2}$$

$$x = -4 \rightarrow f(-4) = 34 + 4 = 38$$

$$x = 1 \rightarrow f(1) = 1 - 2 + 4 = 3$$

$$f(\cos^2 + 2\cos - \frac{1}{2}) = 0$$

$$\cos x = \frac{-2 \pm 1}{1} \rightarrow -\frac{1}{2} \leq -1 \leq \cos \leq 1$$

$$\frac{1}{2} \checkmark \rightarrow x = 4, 3 \dots \rightarrow \tan x = \pm \sqrt{3}$$

$$\Delta = 4 + 2 = 6 \xrightarrow{\sqrt{\Delta}} 3$$

$$\text{جواب} = (\sqrt{3}) = 3$$

ب-۲) $\sqrt{x-1} + \sqrt{y+1} = 3$, $\sqrt{y+1} = \underbrace{3 - \sqrt{x-1}}_{\text{همواره نامنفی!}}$ $\rightarrow 3 - \sqrt{x-1} \geq 0 \rightarrow \sqrt{x-1} \leq 3 \rightarrow x \leq 10$

$\downarrow$
 $x-1 \geq 0 \rightarrow x \geq 1$ I

I, II $\rightarrow 1 \leq x \leq 10 \rightarrow D_f = [1, 10]$