

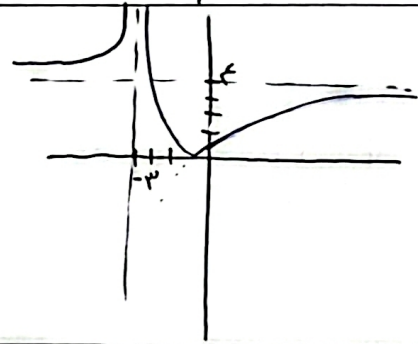
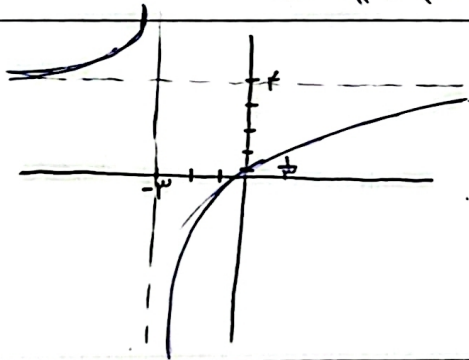
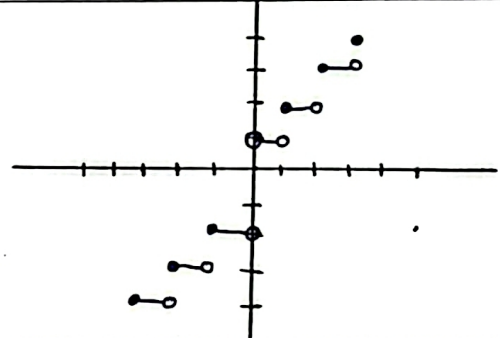
الف) $\sin^2 \rightarrow 0 \rightarrow 2(0) - 1 = -1$
 $\rightarrow 1 \rightarrow 2(1) - 1 = 1$

$$R_f = [-1, 1]$$

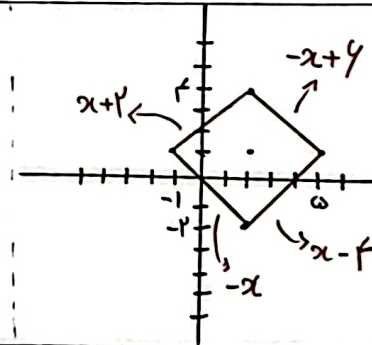
ب) $\cos^3 \rightarrow -1 \rightarrow 3(-1) - 4 = -7$
 $\rightarrow 1 \rightarrow 3(1) - 4 = -1$

$$R_f = [-7, -1]$$

$\{x\} \rightarrow 1 + [x]$ $\begin{cases} x=3 \rightarrow 4 \\ 2 \leq x < 3 \rightarrow 3 \\ 1 \leq x < 2 \rightarrow 2 \\ 0 < x < 1 \rightarrow 1 \end{cases}$
 $\{x\} \rightarrow -1 + [x]$ $\begin{cases} -1 \leq x < 0 \rightarrow -2 \\ -2 \leq x < -1 \rightarrow -3 \\ -3 \leq x < -2 \rightarrow -4 \end{cases}$



$|y-1| \leq x+1$ $\begin{cases} y \geq 1 \rightarrow y \leq x+1 \\ y < 1 \rightarrow y \geq -x \end{cases}$
 $y = x+2$ $y = -x$
 $|y-1| \leq -x+5$ $\begin{cases} y \geq 1 \rightarrow y \leq -x+5 \\ y < 1 \rightarrow y \geq x-4 \end{cases}$
 $y = -x+4$ $y = x-4$



الف) $\{x + \frac{1}{x}\} = t \Rightarrow t + 2\sqrt{t} + 1 - 1 = (\sqrt{t} + 1)^2 - 1$

$\sqrt{t} \geq 0$
 پس فقط بازه $[2, +\infty)$
 برای t قابل قبول است.

$$R_f = [2 + 2\sqrt{2}, +\infty)$$

$\begin{cases} \text{Min} = 2 + 2\sqrt{2} \\ \text{Max} = +\infty \end{cases}$

ب) $-3\sin^2 x - 4\sin x - 2 \rightarrow \sin x \xrightarrow{-1} 0$
 $\xrightarrow{-2} -2$
 $\frac{-b}{2a} = -2$

$$R_f = [-1, 0]$$

$$D_f = \{1, 2, \dots, 9\}$$

$$R_f = \sum_{k=1}^9 \left(-\frac{1}{k} + 10 \right) = \left(-\frac{1}{1} + 10 \right) + \left(-\frac{1}{2} + 10 \right) + \dots + \left(-\frac{1}{9} + 10 \right) = (9 \times 10) + \left(-\frac{1}{1} + \left(-\frac{1}{2} \right) + \dots + \left(-\frac{1}{9} \right) \right)$$

$$= 90 - 10 = \boxed{V_0}$$

$$a = 0$$

$$x^2 \rightarrow 2b + C = 0$$

$$x^2 \rightarrow 2b + C = 1 \rightarrow \boxed{b=1} \quad \boxed{C=-2}$$

$$g(x) = \sqrt{x^2 + 4}$$

$$R_g = [4, +\infty) \rightarrow \boxed{R_g = [2, +\infty)}$$

$$f(x) = \frac{x(x-1)(x+1)}{x+1} = x^2 - x \rightarrow$$

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

$$(x-1)(x+1) = 0$$

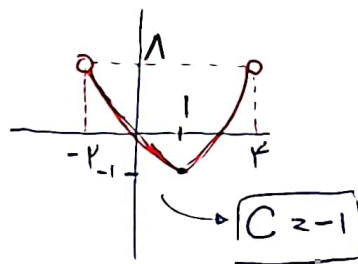
$\rightarrow 1$

$\rightarrow -1$

$$\boxed{a=-1}$$

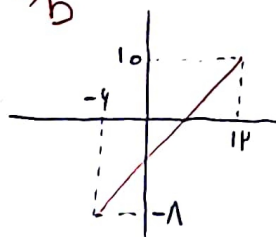
$$\boxed{b=1}$$

$$\boxed{f(-1) = 2}$$



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

$$D_f = [-4, 12]$$



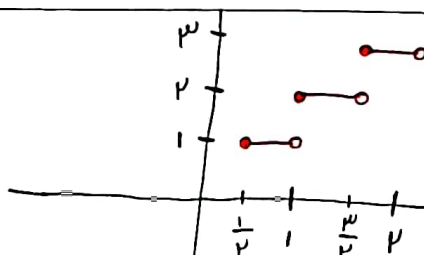
$$\boxed{R_f = [-1, 10]}$$

$$\frac{w}{p} \ll x < 1 \rightarrow 1 + 2 = 3$$

$$1 \ll x < \frac{w}{p} \rightarrow 1 + 1 = 2$$

$$\frac{1}{p} \ll x < 1 \rightarrow 0 + 1 = 1$$

$$\boxed{3 \text{ خطه}}$$



خسته نباشی خوشی خلویم