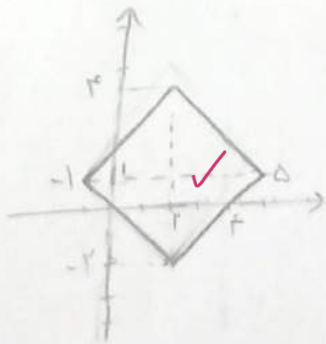
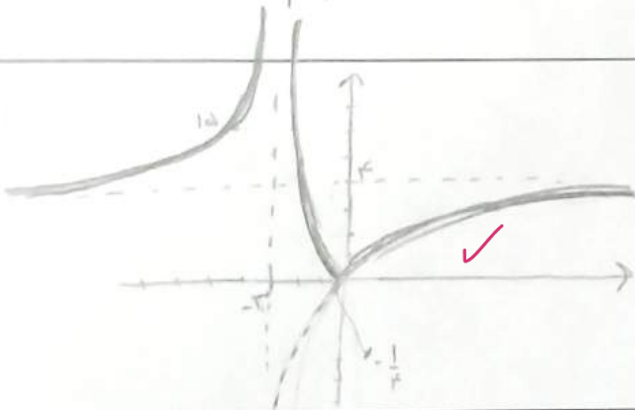
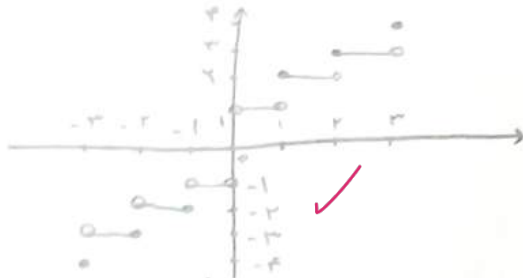


الف) $f(x) = 2\sin^2\left(x + \frac{\pi}{4}\right) - 1$

$$\begin{aligned} & -1 \leq \sin^2\left(x + \frac{\pi}{4}\right) \leq 1 \\ & -2 \leq 2\sin^2\left(x + \frac{\pi}{4}\right) \leq 2 \\ & -1 \leq 2\sin^2\left(x + \frac{\pi}{4}\right) - 1 \leq 1 \\ & R_f = [-1, 1] \end{aligned}$$

ب) $g(x) = 3\cos^2 x - 4$

$$\begin{aligned} & -1 \leq \cos^2 x \leq 1 \\ & -3 \leq 3\cos^2 x \leq 3 \\ & -7 \leq 3\cos^2 x - 4 \leq -1 \\ & R_g = [-7, -1] \end{aligned}$$



$$\begin{aligned} \begin{cases} x > 1 \\ y > 1 \end{cases} & \Rightarrow x - y + 1 = 1 \Rightarrow y = x \\ \begin{cases} x > 1 \\ y < 1 \end{cases} & \Rightarrow x - y + 1 = 1 \Rightarrow y = x \\ \begin{cases} x < 1 \\ y > 1 \end{cases} & \Rightarrow x - y + 1 = 1 \Rightarrow y = x \\ \begin{cases} x < 1 \\ y < 1 \end{cases} & \Rightarrow x - y + 1 = 1 \Rightarrow y = x \end{aligned}$$

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

$$\left(\sqrt{x + \frac{1}{x}} + 1\right)^2 - 1$$

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

ب) $y = (2 - \sin x)(1 + \sin x) \Rightarrow$

$$y = -\sin^2 x + 2\sin x + 2$$

$$\begin{aligned} & \sin x \in [-1, 1] \Rightarrow R_f = [1, 3] \\ & +1 = \frac{2}{1} \end{aligned}$$

$$\frac{9}{7}(9+1) = 12$$

$$-\frac{1}{7}(12) + 9 \times 1 = -12 + 9 = \underline{3}$$

(2)

9

$$f(n) = \sqrt{an^2 + bn + c} \sim \boxed{a=1} \rightarrow \sqrt{bn+c} \sim bn+c, 0$$

$$bn+c, -c \rightarrow n, \frac{c}{b} \sim \frac{c}{b} = 2 \sim -c = 2b$$

$$f(2) = \sqrt{b(2)-2b} = 1 \rightarrow \sqrt{b} = 1 \rightarrow \boxed{b=1} \quad \boxed{c=-2}$$

(2)

9

$$g(n) = \sqrt{n^2 + 1} \sim \begin{vmatrix} 0 \\ 1 \end{vmatrix} \sim R_f: \sqrt{[1, +\infty)} \rightarrow R_f: [1, +\infty)$$

$$f(n) = \frac{n^2 - 1}{n+2} \rightarrow D_f: \mathbb{R} - \{-2\} \sim a = -1$$

$$\frac{n(n^2 - 1)}{n+2} = \frac{n(n-1)(n+1)}{n+2} = n^2 - 1 \sim \begin{vmatrix} 1 \\ -1 \end{vmatrix} \sim R_f: [-1, +\infty) - \{-1\}$$

(2, 1/2)

1

$$f\left(\frac{-1}{-1}\right) = f(1) = \frac{1-1}{1} = 0$$

صفحه آخر...

$$\sqrt[3]{n^3 + an^2 + bn - 1} = \sqrt[3]{(n^3 - 2n^2 + 12n - 1)} = \sqrt[3]{(n-2)^3} = (n-2)$$

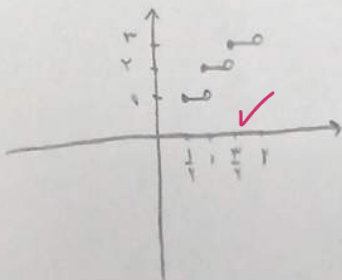
$$a = -2$$

$$b = 12 \sim D_f: [-2, 12]$$

$$R_f: [-1, 12]$$

(2)

9



3/10

(2)

10

$$f(n) = \frac{n(n-2)(n+2)}{n+2} = n^2 - 2n$$

$$n^2 - 2n \neq 8 \rightarrow \begin{cases} n \neq -2 \\ n \neq 4 \end{cases}$$

$y = 8$ در برد تابع نیست یعنی:

پس دامنه تابع است: $D_f = \mathbb{R} - \{-2, 4\}$

$$f(n) = n^2 - 2n \rightarrow \text{ext} \Big|_{-1}^1 \Rightarrow R_f = [-1, +\infty) - \{8\} \quad \text{حالا بیایم سراغ برد!}$$

$$f\left(\frac{a+b}{2c}\right) = f\left(\frac{2}{-2}\right) = f(-1) \rightarrow f(-1) = \textcircled{3}$$