

الف) $0 \leq \sin^2(x + \frac{\pi}{4}) \leq 1 \rightarrow 0 \leq 2 \sin^2(x + \frac{\pi}{4}) \leq 2 \Rightarrow -1 \leq 2 \sin^2(x + \frac{\pi}{4}) - 1 \leq 1$
 $\Rightarrow R_f = [-1, 1]$

ب) $-1 \leq \cos^2 x \leq 1 \rightarrow -2 \leq 2 \cos^2 x \leq 2 \xrightarrow{-4} -6 \leq 2 \cos^2 x - 4 \leq -2 \Rightarrow R_g = [-2, 2]$

$x \in [-3, -2) \rightsquigarrow -1 - 3 = -4$

$x \in [-2, -1) \rightsquigarrow -1 - 2 = -3$

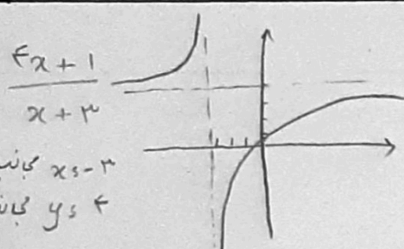
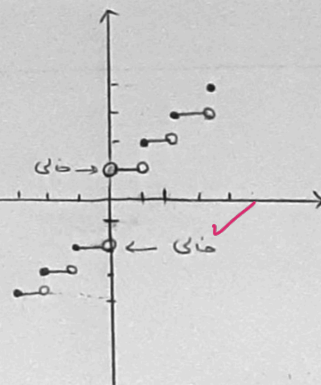
$x \in [-1, 0) \rightsquigarrow -1 - 1 = -2$ در قسمت ۱

$x \in [0, 1) \rightsquigarrow 1 + 0 = 1$

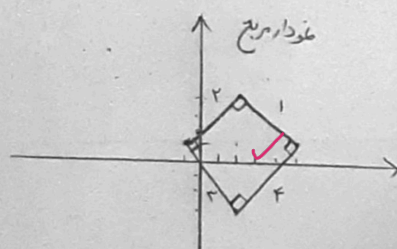
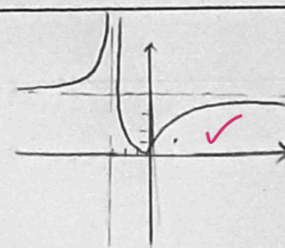
$x \in [1, 2) \rightsquigarrow 1 + 1 = 2$

$x \in [2, 3) \rightsquigarrow 1 + 2 = 3$

$x \in 3 \rightsquigarrow 1 + 3 = 4$



مدرمطلق



۱ ضلع: $x - 2 + y - 1 = 3 \Rightarrow y \leq -x + 4$ ($2 \leq x \leq 5$)
 ۲ ضلع: $-x + 2 + y - 1 = 3 \Rightarrow y \leq x + 2$ ($-1 \leq x \leq 2$)
 ۳ ضلع: $-x + 2 - y + 1 = 3 \Rightarrow y \geq -x$ ($-1 \leq x \leq 2$)
 ۴ ضلع: $x - 2 - y + 1 = 3 \Rightarrow y \geq x - 4$ ($2 \leq x \leq 5$)

الف) $x + \frac{1}{x} = a \rightarrow a \geq 2 \text{ or } a \leq -2 \xrightarrow{\text{استدلال}} a \geq 2 \text{ or } a \leq -2$
 $\rightarrow f(a), a + \sqrt{a^2 - 4} \xrightarrow{a \geq 2} \min f(a), 2 + \sqrt{4 - 4} \rightarrow D_f = (2 + \sqrt{4 - 4}, +\infty)$

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

$\begin{cases} -1 \leq \sin x \leq 1 \\ -1 - 2 + 2 \leq 0 \\ 1 - 1 + 2 = 2 \end{cases} \Rightarrow R_f = [0, 2]$

$D_f = \{1, 2, 3, \dots, 9\} : f(1) = \frac{+29}{9}, f(2) = \frac{+28}{9}, f(3) = \frac{+27}{9}, \dots, f(9) = \frac{+21}{9}$

مجموع $\Rightarrow \frac{+(29 + 28 + \dots + 21)}{9} = +7$

