

① الف) $\sin^2 x \begin{cases} \rightarrow \max \rightarrow 1 \rightarrow ① \\ \rightarrow \min \rightarrow 0 \rightarrow ② \end{cases} \rightarrow R_f = [-1, 1]$

ب) $\begin{cases} 3x(1) - 4 = -1 \\ 3x(-1) - 4 = -7 \end{cases} \rightarrow R_g = [-7, -1]$

② $[-3, -2) \quad -1 - 3 = ④$

$[-2, -1) \quad -1 - 2 = ③$

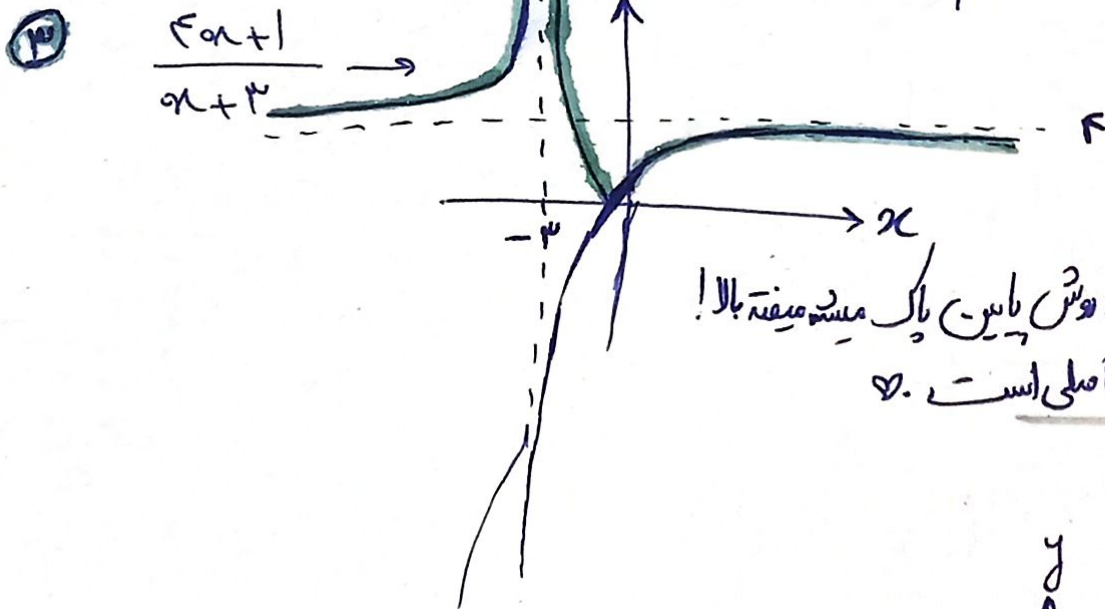
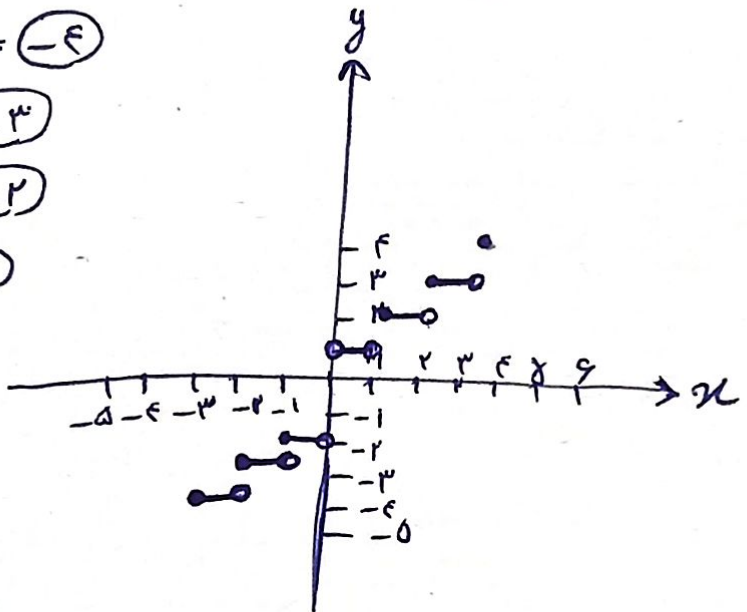
$[-1, 0) \quad -1 - 1 = ②$

$[0, 1) \quad 1 + 0 = ①$

$[1, 2) \quad 1 + 1 = ②$

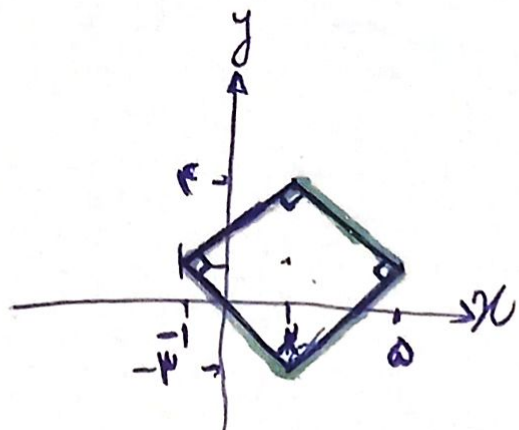
$[2, 3) \quad 1 + 2 = ③$

$3 \rightarrow ④$



وقتی قدر مطلق میاد روش پارسین پاک میشه میفته بالا!
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④ $|x-2| + |y-1| = 3 \rightarrow$



④

الف) $x + \frac{1}{x} + 2\sqrt{x + \frac{1}{x}} \rightarrow \sqrt{x + \frac{1}{x}} = t$

$t^2 + 2t \rightarrow \text{Max} \rightarrow +\infty$
 $\rightarrow \frac{-b}{2a} \rightarrow -1000$

$\rightarrow \text{min} \rightarrow \sqrt{2} \rightarrow 2 + 2\sqrt{2}$

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

ب) $-\sin^2 x + 2\sin x + 3 \rightarrow \text{Max} \rightarrow 4$
 $\rightarrow \frac{-b}{2a} \rightarrow \frac{-2}{-2} \rightarrow 1$
 $\rightarrow \text{min} \rightarrow 0$

$R_y = [0, 4]$

⑤ $\{1, 2, 3, 4, 5, 6, 7, 8, 9\} \rightarrow \frac{1}{x}x + 10 \rightarrow \left\{\frac{10}{1}, \frac{10}{2}, \dots, \frac{10}{9}\right\}$

$\frac{1}{x} \left(\frac{d}{dx} \left(\frac{x}{x} \right) \right) = \boxed{\sqrt{10}}$

⑥ $a=0 \rightarrow \begin{cases} 2b+c=0 \\ 3b+c=1 \end{cases} \rightarrow \boxed{b=1}$

$g(x) = \sqrt{x^2 + 4} \rightarrow R_g = [2, +\infty)$

⑦ $a=-2 \rightarrow f(x) = \frac{x(x+2)(x-2)}{(x+2)} \rightarrow x^2 - 2x = 1$

$x^2 - 2x$

$\rightarrow \boxed{b=2}$

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

$\rightarrow \frac{-b}{2a} \rightarrow c = 1 - 2 = \boxed{-1}$

$f(-1) = \boxed{3}$

⑧ $(x-2)^3 = x^3 - 6x^2 + 12x - 8 \rightarrow \boxed{a=-6}$

$\boxed{b=12}$

$y = x - 2 \rightarrow R_y = [-1, 10]$

$D_y = [-6, 12]$

① $[\frac{1}{4}, 1)$ $0 + 1 = ①$
 $[1, \frac{3}{4})$ $1 + 1 = ②$
 $[\frac{3}{4}, 2)$ $1 + 2 = ③$

