

الف: $2x_0 - 1 = -1$

$2x_1 - 1 = 1$

$R_f = [-1, 1]$

ب: $3x - 1 - 4 = -7$

$3x_1 - 4 = -1$

$R_g = [-7, -1]$

$[-3, -2) \rightarrow -4$

$[-2, -1) \rightarrow -3$

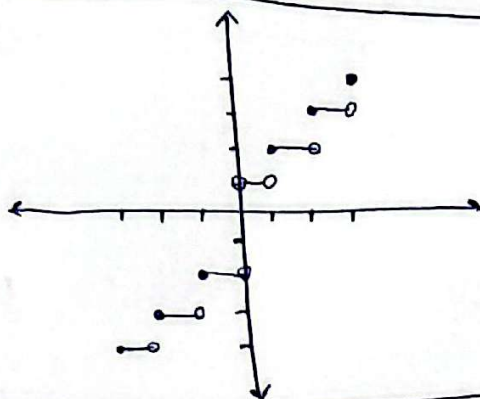
$[-1, 0) \rightarrow -2$

$[0, 1) \rightarrow 1$

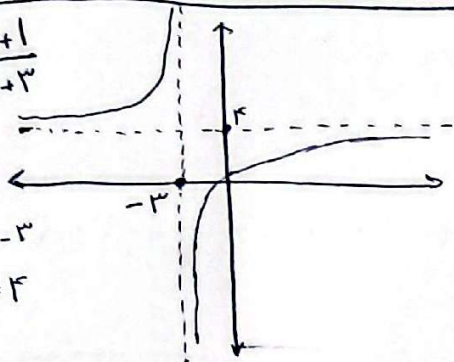
$[1, 2) \rightarrow 2$

$[2, 3) \rightarrow 3$

$\{3\} \rightarrow 4$

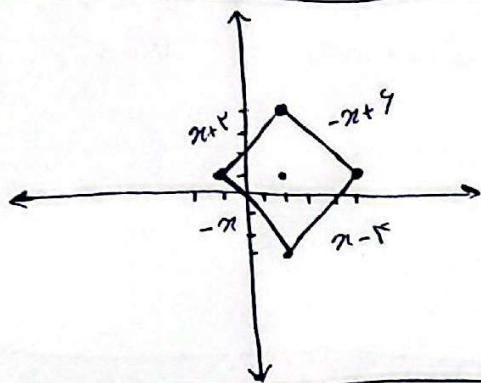
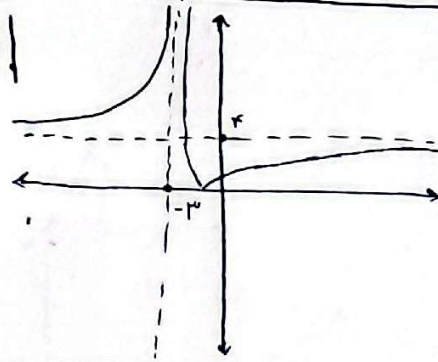


$y = \frac{x+1}{x+3}$



مجاانب عبور = -3
مجاانب افقی = 1

$y = \left| \frac{x+1}{x+3} \right|$



$x > 2 \quad y > 1 \Rightarrow x+2+y-1=3 \Rightarrow y = -x+1$

$x > 2 \quad y < 1 \Rightarrow x-2+1-y=3 \Rightarrow y = x-4$

$x < 2 \quad y > 1 \Rightarrow 2-x+y-1=3 \Rightarrow y = x+2$

$x < 2 \quad y < 1 \Rightarrow 2-x+1-y=3 \Rightarrow y = -x$

الف: $x + \frac{1}{x} \geq 2$

$\sqrt{x + \frac{1}{x}} \geq \sqrt{2}$

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

زیر، ادا یکال می شود $x + \frac{1}{x} \leq -2$

$\therefore 3 + 3\sin x - \sin x - \sin^2 x = -\sin^2 x + 2\sin x + 3$

$$\sin x \begin{cases} -1 \rightarrow -1 - 2 + 3 = 0 \\ 1 \rightarrow -1 + 2 + 3 = 4 \\ \frac{1}{2} \rightarrow 1 \rightarrow 4 \end{cases}$$

$R_f = [0, 4]$

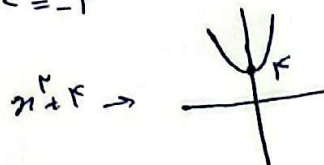
$$\begin{aligned}
 1 &\rightarrow -\frac{1}{4} + 10 = \frac{39}{4} & 9 &\rightarrow -\frac{9}{4} + 10 = \frac{31}{4} = 7.75 \\
 2 &\rightarrow -\frac{2}{4} + 10 = \frac{19}{2} & 1 &\rightarrow -\frac{1}{4} + 10 = \frac{39}{4} \\
 3 &\rightarrow -1 + 10 = 9 & 9 &\rightarrow -\frac{9}{4} + 10 = \frac{31}{4} = 7.75 \\
 4 &\rightarrow -\frac{4}{4} + 10 = \frac{9}{1} = 9 & & \\
 5 &\rightarrow -\frac{5}{4} + 10 = \frac{35}{4} & &
 \end{aligned}$$

$$3b + c = 1$$

$$2b + c = 0$$

$$b = 1$$

$$c = -2$$



$$\sqrt{bx^2 + ax - 2c} = \sqrt{x^2 + 4}$$

چون فقط در بازه $[2, +\infty)$ است مثبت نیست و تابع خطی است پس $d=0$

$$\sqrt{[4, +\infty)} = [2, +\infty)$$

$$R_f = [2, +\infty)$$

$$\frac{n(n^2 - 4)}{n + 2} = \frac{n(n+2)(n-2)}{n+2} = n(n-2) = n^2 - 2n$$

$$n^2 - 2n = 1 \quad n^2 - 2n - 1 = 0$$

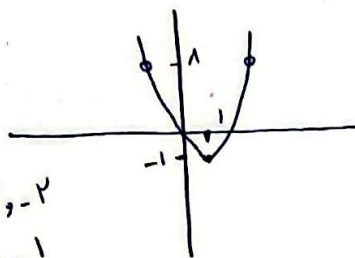
$$(n-4)(n+2) = 0$$

$$n = 4$$

$$n = -2$$

$$b, a = 4, -2$$

$$c = -1$$



$$\frac{a+b}{2c} = \frac{4-2}{-2} = -1$$

$$f(-1) = n^2 - 2n = 1 + 2 = 3$$

$$\sqrt{(n-2)^3}$$

$$(n-2)^3 = n^3 - 6n^2 + 12n - 8 = n^3 + an^2 + bn - 8$$

$$a = -6$$

$$b = 12$$

$$[-6, 12]$$

$$n-2 \rightarrow -6-2 = -8$$

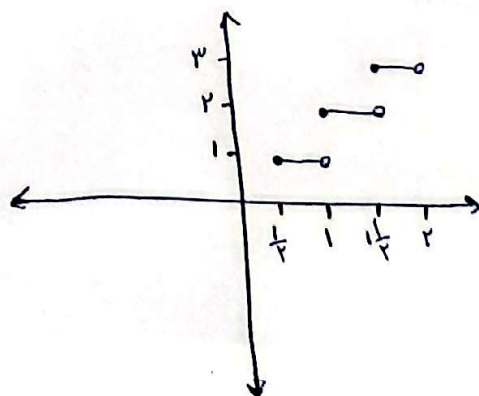
$$n-2 \rightarrow 12-2 = 10$$

$$R_f = [-8, 10]$$

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

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

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



۳ بار خط