

الف) $\square \rightarrow \begin{cases} 1 \rightarrow 2-1 = 1 \\ 0 \rightarrow 0-1 = -1 \\ \frac{-b}{2a} = 0 \end{cases}$

$\Rightarrow R_f = [-1, 1]$ یا رسم شکل روی طرقاتی ترده یا رسم در بازه $2x[0, 1] \rightarrow [-1, 1]$

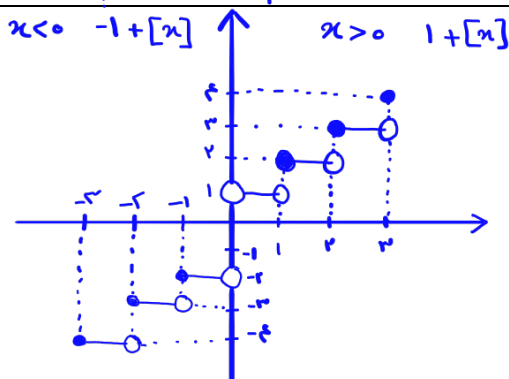
ب) $\square \rightarrow \begin{cases} 1 \rightarrow 2-4 = -1 \\ -1 \rightarrow -2-4 = -6 \end{cases}$

$R_g = [-6, -1]$

یا $3 \times [-1, 1] \rightarrow [-3, 3]$

$y = \frac{x}{|x|} + [x]$

$x \neq 0$

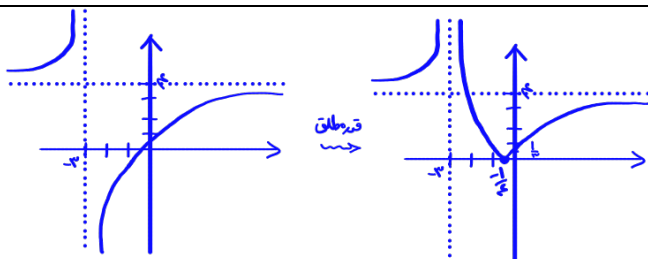


$y = \frac{x+1}{x+3}$

$q = -3$

$1^2 = \frac{4}{1} = 4$

$\begin{vmatrix} 0 & -\frac{1}{2} \\ \frac{1}{3} & 0 \end{vmatrix}$



$|x-2| + |y-1| = 3$

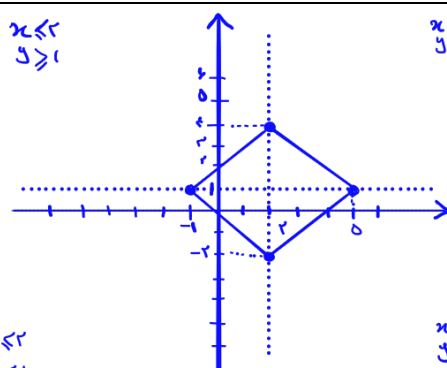
$-x+2+y-1=3 \Rightarrow y=x+2$

$\begin{vmatrix} 2 & -1 \\ 1 & 1 \end{vmatrix}$

$\begin{vmatrix} 2 & -1 \\ -2 & 1 \end{vmatrix}$

$y = -x$

$-x+2-y+1=3 \Rightarrow -x-y+3=3 \Rightarrow -x-y=0 \Rightarrow y=-x$



$x \geq 2$
 $y \geq 1$

$y-1+x-2=3 \Rightarrow y=-x+6$

$\begin{vmatrix} 2 & 1 \\ 1 & 1 \end{vmatrix}$

$x \geq 2$
 $y \leq 1$

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

$\begin{vmatrix} 2 & 1 \\ -1 & 1 \end{vmatrix}$

الف) $t^2 + 2t \rightarrow \square \rightarrow \begin{cases} \sqrt{2} \rightarrow 2+2\sqrt{2} = 4\sqrt{2} \\ +\infty \rightarrow \infty \\ \frac{-2}{2} = -1 \end{cases}$

$t = \sqrt{x + \frac{1}{x}}$

$\sqrt{x + \frac{1}{x}} \rightarrow R = [-\infty, -1] \cup [1, +\infty)$
 $= [\sqrt{2}, +\infty)$

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

ب) $y = -\sin^2 t + \sin t + 3 \rightarrow \begin{cases} 1 \rightarrow -1+2+3 = 4 \\ -1 \rightarrow -1-1+3 = 1 \\ \frac{-1}{2} = -\frac{1}{2} \end{cases}$

$R_g = [1, 4]$

$$D_f = \{1, 2, 3, 4, 5, 6, 7, 8, 9\} \rightarrow \left(-\frac{1}{r}x\right) + 1 + \left(-\frac{1}{r}x\right) + 1 + \dots \rightarrow \frac{-1}{r} \left(1 + \cancel{1} + \dots + 1\right) + \cancel{1} \left(\frac{9}{r}\right) = -10 + 9 = -1 \quad (\text{V}\Delta)$$

$$\{x \mid x < 1, x \in \mathbb{N}\}$$

$$\frac{nxn+1}{r} = \frac{1 \cdot 1}{r} = \frac{1}{r}$$

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$$[r, \infty) \rightarrow r = \frac{2}{\sqrt{3}}, \text{ geb } \rightarrow a = 0$$

$$f(r) = \sqrt{rb+c} = 1$$

$$\forall b+c=0$$

$$\forall b+c=1 \rightarrow b+0=1$$

$$b=1 \quad c=-r$$

$$g = \sqrt{x^r + c} \rightarrow R_g = \sqrt{[c, +\infty)} = [r, +\infty)$$

$$\frac{-b}{\frac{r}{c}a} = 0$$

$$\frac{\frac{r}{c}a}{\frac{r}{c}a} = \frac{r}{c}$$

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$$f(x) = \frac{x(x-r)(x+r)}{x+r}$$

$$D = \mathbb{R} - \{a, b\}$$

$$R = [c, +\infty) - \{1\}$$

$$x^r - rx \neq 1$$

$$x^r - rx - 1 \neq 0$$

$$(x-r)(x+r) \neq 0 \rightarrow x \neq \begin{matrix} a = r \\ b = -r \end{matrix}$$

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

$$f\left(\frac{a+b}{rc}\right) = f\left(\frac{r-r}{-r}\right) = 1+r = 3$$

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$$\text{geb} \rightarrow \sqrt[r]{(x+k)^r} = \sqrt[r]{x^r + kx^r + k^r x + k^r} \rightarrow \sqrt[r]{(x-r)^r} = x-r \xrightarrow{\text{U, geo}} \begin{vmatrix} -r \\ -1 \end{vmatrix} \begin{vmatrix} 1r \\ 1 \end{vmatrix}$$

$$K^r = -1$$

$$K = -r$$

$$(x-r)^r = x^r - rx^r + 1rx - 1$$

$$a = -r$$

$$b = 1r$$

$$D = [-r, 1r]$$

$$R_f = [-1, 10]$$

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$$y = \begin{bmatrix} x \end{bmatrix} + \begin{bmatrix} x + \frac{1}{r} \end{bmatrix}$$

$$\begin{matrix} \swarrow & \searrow \\ [\frac{1}{r}, 1) & [1, 2) \\ \textcircled{0} & \textcircled{1} \end{matrix} \quad \dots \quad \begin{matrix} \swarrow & \searrow & \searrow \\ [\frac{1}{r}, 1) & [1, \frac{r}{r}) & [\frac{r}{r}, 2) \\ \textcircled{1} & \textcircled{1} & \textcircled{2} \end{matrix}$$

$$+ = \begin{bmatrix} 1 \end{bmatrix} \quad \begin{bmatrix} 2 \end{bmatrix} \quad \begin{bmatrix} 3 \end{bmatrix}$$

$$\Rightarrow \frac{1}{r}, \frac{r}{r}, 2$$

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