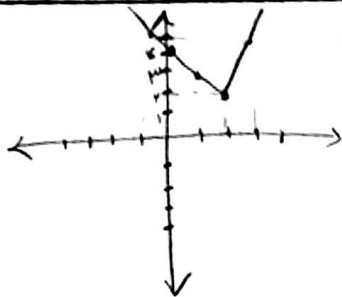


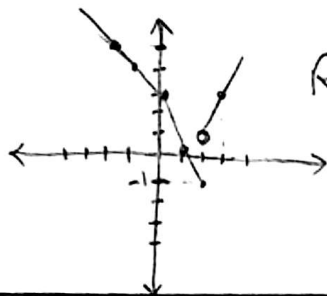
الف) $\begin{cases} 3x-4 : x > 2 \\ 2 : x = 2 \\ -x+4 : x < 2 \end{cases}$



$R = [2, +\infty)$

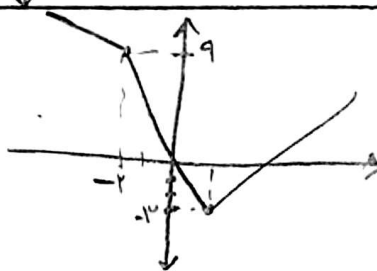
-۱

ب) $\begin{cases} 2x-3 : x > 2 \\ -2x+3 : 0 \leq x < 1 \\ -x+1 : 1 \leq x \leq 2 \\ -x+3 : x < 0 \end{cases}$



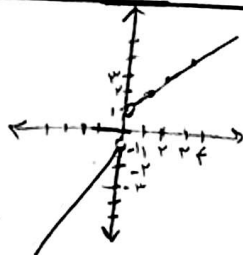
$R = [-1, +\infty)$

$\begin{matrix} -2 & 1 \\ -2x+3 & -2x-1 & 2x-3 \\ \textcircled{3} & \textcircled{-2} \end{matrix}$
 $K = -3$

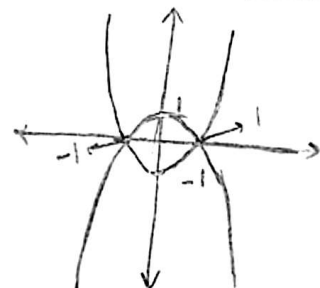


-۲

الف) $\begin{cases} x > 0 \rightarrow x+1 \\ x < 0 \rightarrow x-1 \end{cases}$

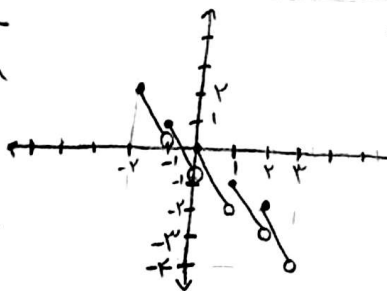


ب) $\begin{cases} x > 0 \rightarrow x^2-1 \\ x < 0 \rightarrow -x^2+1 \end{cases}$

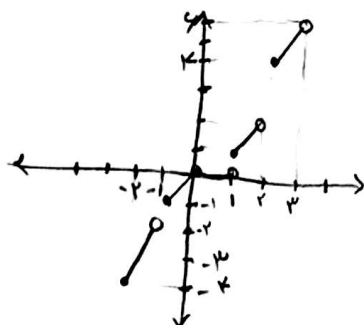


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الف) $\begin{cases} -2 \leq x < -1 \rightarrow -2-2x \\ -1 \leq x < 0 \rightarrow -1-2x \\ 0 \leq x < 1 \rightarrow -2x \\ 1 \leq x < 2 \rightarrow -2x+1 \\ 2 \leq x < 3 \rightarrow -2x+2 \end{cases}$



ب) $\begin{cases} -2 \leq x < -1 \rightarrow 2x \\ -1 \leq x < 0 \rightarrow x \\ 0 \leq x < 1 \rightarrow 0 \\ 1 \leq x < 2 \rightarrow x \\ 2 \leq x < 3 \rightarrow 2x \end{cases}$



الف) $R = [0, 1)$

-۴

ب) $f(x - [x]) \Rightarrow R = [0, 1)$

ج) $y = \sin\left(\frac{x}{\omega} - \left[\frac{x}{\omega}\right]\right) \Rightarrow R = [0, \omega)$

د) $[-1, 0]$

$$\text{ii)} \quad -\sqrt{13} \leq x \sin \alpha + y \cos \alpha \leq \sqrt{13} \Rightarrow R = [-\sqrt{13}, \sqrt{13}] \quad -9$$

$$\therefore -\sqrt{10} \leq x \sin \alpha - y \cos \alpha \leq \sqrt{10} \Rightarrow R = [-\omega, \omega]$$

$$\Rightarrow \frac{-\sqrt{19}}{-0.138} \leq Y \sin \alpha + 0 \cos \alpha \leq \frac{\sqrt{19}}{0.138} \xrightarrow{\text{الماتريks}} \begin{cases} -4 & 0 \\ -0.138 & 1 \\ -1 & 0 \\ -1 & 0 \\ -1 & 0 \\ -1 & 0 \end{cases} \rightarrow R = \begin{cases} -4, -0.138, -1, -1, -1, -1 \\ -1, 0, 0, 1, 1, 1, 1, 0 \end{cases}$$

$$2) -\sqrt{\omega} \leq -Y \sin \alpha + Z \cos \alpha \leq \sqrt{\omega} \quad R = [0, \sqrt{\omega}]$$

الف) $\sin \alpha \rightarrow -1 \Rightarrow y = 1$
 $\quad \quad \quad \hookrightarrow 1 \Rightarrow y = 6$
 $\quad \quad \quad \hookrightarrow -\frac{b}{ra} = -\frac{r}{r} \Rightarrow y = -\frac{1}{r}$

$$\begin{aligned} \therefore) \sin \alpha &\rightarrow -1 \Rightarrow y = -1 \\ &\quad \swarrow \rightarrow 1 \Rightarrow y = v \\ &\quad \searrow \rightarrow -\frac{b}{r \sin \alpha} = -\frac{r}{r} \Rightarrow y = \frac{v}{\lambda} \end{aligned} \quad \Rightarrow R = \left[\frac{v}{\lambda}, v \right]$$

الف) $1 - \cos^2 x + 4 \cos^2 x = 1 + 3 \cos^2 x \begin{cases} 0 \Rightarrow y = 1 \\ 1 \Rightarrow y = 4 \end{cases} \Rightarrow R = [1, 4]$

$$\therefore r \times \frac{\cos \theta}{\sin \theta} \times \sin \theta = r \cos \theta \sin \theta = \sin \theta \Rightarrow R \in [9]$$

الف) $\frac{1}{r} \leq \sin^2 \theta + \cos^2 \theta \leq 1 \Rightarrow R = \left[\frac{1}{r}, 1 \right]$
 $r = \left(\frac{1}{r} \right)^2 = \frac{1}{r}$

$$\text{جواب: } \sin^2 \theta + \cos^2 \theta = 1 \xrightarrow{\text{برکتنش}} \begin{cases} 0 \\ 1 \end{cases} \Rightarrow R = \{0, 1\}$$

$$\frac{(y_{n-1})(q_n + k)}{q_n + k} = y_{n-1} \rightarrow$$
 $\Rightarrow R = IR - \{9\}$

$$\therefore \frac{(n-1)(n^2+n+1)}{n-1} = n^2+n+1 \Rightarrow R = \left[\frac{n}{2}, +\infty\right)$$

$$\left| -\frac{b}{r_a} = \frac{1}{r} \right|$$