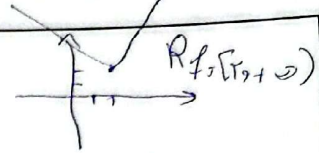


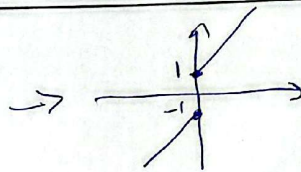
الف) $2x - 4 > 0 \rightarrow 2x > 4 \rightarrow x > 2 \rightarrow y = 2x - 4$
 $2x - 4 < 0 \rightarrow 2x < 4 \rightarrow x < 2 \rightarrow y = 4 - 2x$



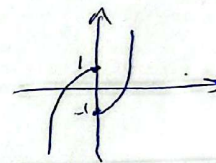
ب)

الف) $(2x - 4)(x + 2) + k \xrightarrow{\text{توان}} 9x^2 + 9 - 14x = x^2 + 4x + 4 + k + 2x + 4x + 4k$
 $1x^2 + 2(k + 11)x - k^2 - 4k + 2 > 0 \xrightarrow{\Delta} (11 + k)^2 - 4(1)(-k^2 - 4k + 2) > 0$
 $= 9k^2 + 20k + 11 > 0 \rightarrow \underline{k > 3}$

الف) $\begin{cases} x > 0 \rightarrow y = x + 1 \\ x < 0 \rightarrow y = x - 1 \\ x = 0 \rightarrow \text{تغییر شیب} \end{cases}$

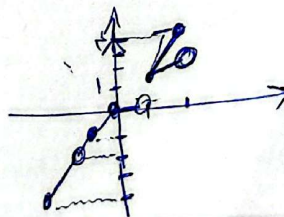


ب) $\begin{cases} x > 0 \rightarrow y = x^2 - 1 \\ x < 0 \rightarrow y = -x^2 + 1 \\ x = 0 \rightarrow \text{تغییر شیب} \end{cases}$



الف) $y = [x] \cdot x$

ب) $y = [x] |x|$



الف) $R_f = [2, 1]$

ب) $f(x - [x]) \xrightarrow{R(x - [x]) = [2, 1]} R_f = [2, 1]$

ج) $\Delta(\frac{x}{2} - [\frac{x}{2}]) \Rightarrow R = [0, 2]$

د) $R_f = [-1, 2]$

الف) $\sqrt{12} \leq r \sin u + r \cos u \leq \sqrt{12} \rightarrow [-\sqrt{12}, \sqrt{12}]$

ب) $-2 \leq r \sin u + (-r) \cos u \leq 2 \rightarrow [-2, 2]$

ج) $y = [r \sin u + r \cos u]$ $-\sqrt{12} \leq r \sin u + r \cos u \leq \sqrt{12} \xrightarrow{\text{بجاء}} [-\sqrt{12}, \sqrt{12}]$

د) $y = \sqrt{12} \sin u - r \sin u$ $-\sqrt{12} \leq \sqrt{12} \sin u - r \sin u \leq \sqrt{12} \rightarrow [-\sqrt{12}, \sqrt{12}]$

الف) $y = r \sin^2 u + r \sin u + r$ $u_{rs} = -\frac{r}{r}$ $R_f = [-r, r]$
 $y_r = \frac{r}{r} - \frac{r}{r} + r = -\frac{1}{r}$

ب) $y = r \sin^2 u + r \sin u + r$ $u = -\frac{r}{r}$
 $R_f = \left[\frac{r}{\lambda}, r \right]$ $y = \frac{r}{\lambda}$

ج) $y = r \sin^2 u$