

الف) $\begin{cases} x+2x-4 & x > 2 \\ 2 & x = 2 \\ x-2x+4 & x < 2 \end{cases} \rightarrow \begin{cases} 3x-4 & x > 2 \\ 2 & x = 2 \\ -x+4 & x < 2 \end{cases}$  $R = [2, +\infty)$

$\begin{array}{c|c|c|c} 0 & 1 & 2 & \\ \hline -2+3 & -5x+3 & -2+1 & 2-5 \end{array}$ $R = [-1, +\infty)$

$\begin{array}{c|c|c} -2 & 1 & \\ \hline -3x+3+x+2 & -3x+3-x-2 & 3x-3-x-2 \end{array}$

$\begin{array}{c|c|c} -2x+5 & -4x-1 & 2x-9 \end{array}$

$\begin{array}{c|c|c} x < -2 & -2 < x < 1 & x > 1 \end{array}$

$1 < -3$

$K = -3$

$K < -3$

ریشه ندارد
یک ریشه دارد
دو ریشه دارد

الف) $x \neq 0$

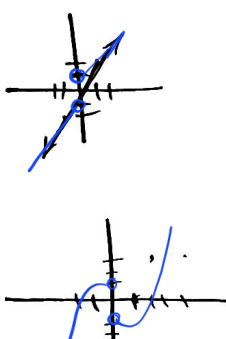
$x > 0 \quad x+1$

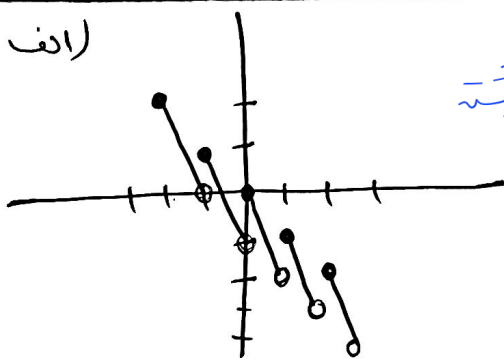
$x < 0 \quad x-1$

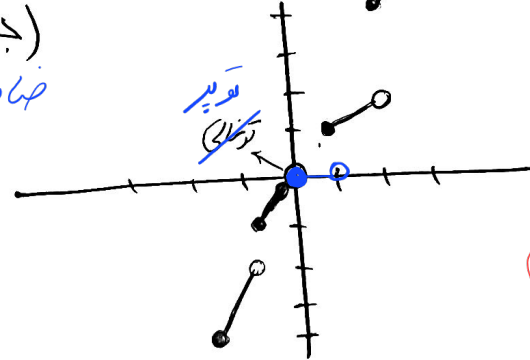
$\rightarrow x \neq 0$

$x > 0 \quad x^2-1$

$x < 0 \quad -x^2+1$



الف)  $\rightarrow$ ضرایب ها نوشته شود

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الف) $R = [0, 1)$

$\rightarrow 4(x-[x]) \rightarrow 0 \leq 4(x-[x]) < 4$ $R = [0, 4)$

ج) $R = [0, 5)$

د) $(2x-[2x]) [0, 1) \xrightarrow{x-} (-1, 0]$ $R = (-1, 0]$

الف) $-\sqrt{9+k} \leq 4\sin x + 4\cos x \leq \sqrt{9+k}$

$R = [-\sqrt{13}, \sqrt{13}]$

$\Rightarrow -\sqrt{14+9} \leq 4\sin x - 4\cos x \leq \sqrt{14+9}$

$R = [-9, 9]$

ج) $-\sqrt{29} \leq 4\sin x + 4\cos x \leq \sqrt{29} \rightarrow [4\sin x + 4\cos x]$

$R = \left\{ \begin{matrix} -9, -9, -9, -9, -9 \\ -1, 0, 1, 2, 3, 4, 9 \end{matrix} \right\}$

$\Rightarrow [-1, \sqrt{5}]$

الف) $\sin x = \frac{-b}{4a} = \frac{-3}{4} \rightarrow \frac{-1}{4} \min$

$R = \left[\frac{-1}{4}, 4 \right]$

$\sin x = 1 \rightarrow 4 \max$

$\sin x = -1 \rightarrow 0$

$\Rightarrow \sin x = \frac{-b}{4a} = \frac{-3}{4} \rightarrow \frac{3}{4} \min$

$R = \left[\frac{3}{4}, 4 \right]$

$\sin x = 1 \rightarrow 4 \max$

$\sin x = -1 \rightarrow 0$

الف) $y = \sin^2 x + 4(1 - \sin^2 x) \rightarrow -3\sin^2 x + 4 \rightarrow \sin^2 x \in [0, 1]$

$R = [1, 4]$

$\Rightarrow \frac{\cos x}{\sin x} \times \sin^2 x = \cos x \sin x \rightarrow \frac{1}{4} \sin^2 x \rightarrow R = \left[-\frac{1}{4}, \frac{1}{4} \right]$

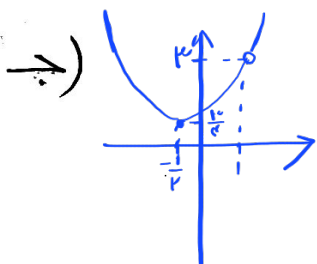
$\rightarrow \sin^2 x = [-1, 1]$

الف) $\sqrt{1} \leq \sin^4 x + \cos^4 x \leq 1 \quad \frac{1}{4} \leq \sin^2 x + \cos^2 x \leq 1 \quad R = \left[\frac{1}{4}, 1 \right]$

$\Rightarrow \sqrt{1} \leq \sin^2 x + \cos^2 x \leq 1 \quad \frac{1}{4} \leq \sin^2 x + \cos^2 x \leq 1$

$|\sin^2 x + \cos^2 x| \rightarrow \begin{cases} 0 \\ 1 \end{cases} \rightarrow R = \{0, 1\}$

الف) $y = \frac{(2x+4)(2x-1)}{2x+4} = 2x-1 \rightarrow 2(-4)-1=-9 \rightarrow R = \mathbb{R} - \{-9\}$



$R = \left[\frac{4}{9}, +\infty \right)$