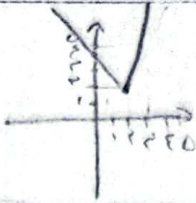


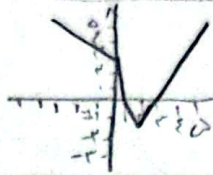
$$y = \begin{cases} 3x - 5 & x \geq 2 \\ -x + 5 & x \leq 2 \end{cases}$$



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

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$$y = \begin{cases} 3-x & x < 0 \\ 2-3x & 0 < x < 1 \\ 1-x & 1 < x < 2 \\ x-3 & 2 \leq x \end{cases}$$



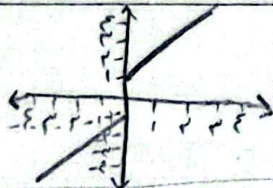
$$R = [-1, +\infty)$$

$$F(x) = \begin{cases} 0-2x=k & x \leq -2 \\ 1-4x=k & -2 \leq x \leq 1 \\ 2x-1=k & 1 \leq x \end{cases}$$

$$K = -3$$

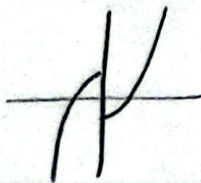
۲

$$y = \begin{cases} x-1 & x < 0 \\ x+1 & x > 0 \end{cases}$$

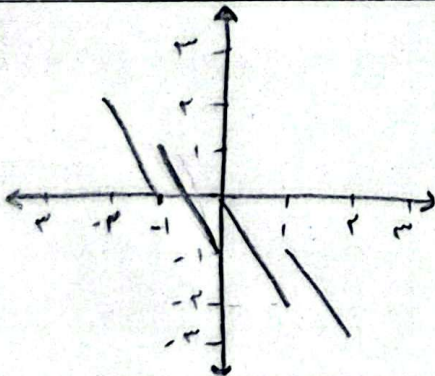


۳

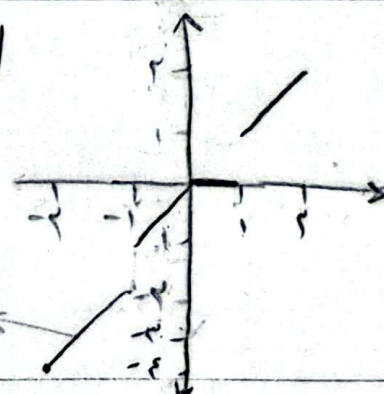
$$y = \begin{cases} x^2+1 & x < 0 \\ x-1 & x > 0 \end{cases}$$



$$[x] - 2x$$



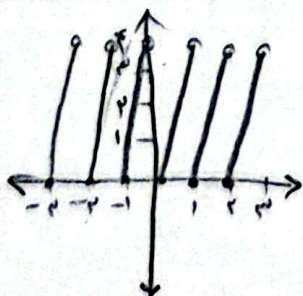
$$[x] |x|$$



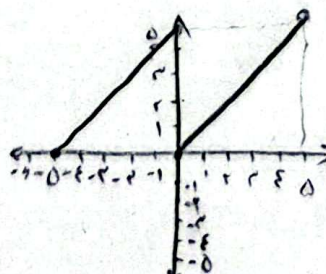
۴

$$2x - [2x] \xrightarrow{\text{شیب}} a - [a]$$

$$R = [0, 1)$$



$$R = [0, 1)$$



$$R = [0, 1)$$

$$[2x] - 2x \xrightarrow{\text{شیب}} [a] - a$$

$$R = [0, 1)$$

۵

الف $R = [-\sqrt{13}, \sqrt{13}]$	ب $R = [0, 10]$	ج $[\sqrt{19}] = -4$ $[\sqrt{19}] = 0$ $R = [-4, 0]$	د $a \cos x + b \sin x$ $R = \sqrt{a^2 + b^2}$ $R = \sqrt{1^2 + 1^2}$ $R = \sqrt{2}$ $>$	هـ
الف $y = (\sin x + 2)(\sin x + 1)$ $\sin x = -1 \rightarrow y = 0$ $\sin x = 1 \rightarrow y = 4$ $R = [0, 4]$	ب $y = (2 \sin x + 1)(\sin x + 1) + 1$ $\sin x = 0 \rightarrow y = 1$ $\sin x = 1 \rightarrow y = 4$ $R = [1, 4]$	ج $y = (2 \sin x + 1)(\sin x + 1) + 1$ $\sin x = 0 \rightarrow y = 1$ $\sin x = 1 \rightarrow y = 4$ $R = [1, 4]$	د $y = (2 \sin x + 1)(\sin x + 1) + 1$ $\sin x = 0 \rightarrow y = 1$ $\sin x = 1 \rightarrow y = 4$ $R = [1, 4]$	هـ
الف $y = \sin^2 x + \cos^2 x + 2 \cos x = 1 + 2 \cos x$ $\cos x = -1 \rightarrow y = -1$ $\cos x = 1 \rightarrow y = 3$ $R = [-1, 3]$	ب $y = \frac{2 \cos x}{\sin x} = 2 \cot x$ $\sin x = -\frac{\sqrt{2}}{2} \rightarrow y = -1$ $\sin x = \frac{\sqrt{2}}{2} \rightarrow y = 1$ $R = [-1, 1]$	ج $y = \frac{2 \cos x}{\sin x} = 2 \cot x$ $\sin x = -\frac{\sqrt{2}}{2} \rightarrow y = -1$ $\sin x = \frac{\sqrt{2}}{2} \rightarrow y = 1$ $R = [-1, 1]$	د $y = \frac{2 \cos x}{\sin x} = 2 \cot x$ $\sin x = -\frac{\sqrt{2}}{2} \rightarrow y = -1$ $\sin x = \frac{\sqrt{2}}{2} \rightarrow y = 1$ $R = [-1, 1]$	هـ
الف $\frac{1}{2} \leq \sin^2 x + \cos^2 x \leq 1$ $R = [\frac{1}{2}, 1]$	ب $R = [\frac{1}{2}, 1] = [0, 1]$	ج $R = [\frac{1}{2}, 1] = [0, 1]$	د $R = [\frac{1}{2}, 1] = [0, 1]$	هـ
الف $y = \frac{(x+1)(x-1)}{x+1} = x-1$ $R = \mathbb{R}$	ب $y = \frac{x^2-1}{x-1} = \frac{(x-1)(x+1)}{x-1} = x+1$ $\frac{-b}{2a} = -\frac{1}{2}$ $\frac{1}{2} - \frac{1}{2} + 1 = 1$ $R = [1, +\infty)$	ج $y = \frac{x^2-1}{x-1} = \frac{(x-1)(x+1)}{x-1} = x+1$ $\frac{-b}{2a} = -\frac{1}{2}$ $\frac{1}{2} - \frac{1}{2} + 1 = 1$ $R = [1, +\infty)$	د $y = \frac{x^2-1}{x-1} = \frac{(x-1)(x+1)}{x-1} = x+1$ $\frac{-b}{2a} = -\frac{1}{2}$ $\frac{1}{2} - \frac{1}{2} + 1 = 1$ $R = [1, +\infty)$	هـ