نام و نام خانوادگی ....آرمین خاکسار وادی.... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

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$xy-y=x^2+x+2 \Rightarrow$ $xy-y=x^2+x+2$

$\Rightarrow x^2+(1-y)x+y+2=0$ $\Delta\geq 0: y^2-2y+1-4y-8\geq 0$

$\Rightarrow y^2-6y-8\geq 0 \Rightarrow (y+1)(y-7)\geq 0$ $y=(-\infty,-1]\cup[7,+\infty)$

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الف) $y=2x^2-5x+1 \xrightarrow{a>0} R=[y_{min},+\infty)$

$x_r=\frac{5}{4} \Rightarrow y_{min}=-\frac{17}{8}$ $R=[-\frac{17}{8},+\infty)$

ب) $y=\sqrt{-x^2+6x-5} \Rightarrow R=[0,$ [illegible]$]$

$\Rightarrow x_r=3 \Rightarrow y_{max}=2 \Rightarrow R=[0,2]$

ج) $y=\sqrt{x^4-2x^2+4x+1}$ $\Rightarrow R=[0,$ [illegible]$] \longrightarrow R=[0,+\infty)$

د) $\longrightarrow$ [illegible] $[0,+\infty) \Rightarrow \mathbb{R}^+ \to \mathbb{R}$

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الف) $y=\frac{3x+1}{2x-6}$ $y=\mathbb{R}-\{\frac{a}{c}\} \Rightarrow y=\mathbb{R}-\{\frac{3}{2}\}$

ب) $y=\frac{\sqrt{4x+1}}{x-2} \Rightarrow y\geq 0,\ y\neq \frac{a}{c} \Rightarrow y=[0,2)\cup(2,+\infty)$

ج) $y=\frac{x^2+4}{\sqrt{x^2+3}}=\sqrt{x^2+3}+\frac{1}{\sqrt{x^2+3}} \Rightarrow y\geq\sqrt{3}+\frac{1}{\sqrt{3}}=\frac{4\sqrt{3}}{3} \Rightarrow y=[\frac{4\sqrt{3}}{3},+\infty)$

د) $y=\frac{1}{x^2+4x+\frac{17}{4}} \Rightarrow y\geq 4+\frac{1}{4}-4 \Rightarrow y\geq\frac{1}{4} \Rightarrow y=[\frac{1}{4},+\infty)$

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$y=\frac{3x^2+4}{x^2-1} \xrightarrow{\text{دو جمله}} -4,\ 3 \Rightarrow \longrightarrow y=(-\infty,-4]\cup[3,+\infty)$

$y=\frac{3x^2+4}{x^2-1} \xrightarrow{\text{وارون}} x^2=\frac{y+4}{y-3}\geq 0$ $y=(-\infty,-4]\cup[3,+\infty)$

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$y=\frac{2\sin x-1}{\sin x+3} \longrightarrow \begin{cases}\sin x=1 \Rightarrow y=-\frac{3}{2}\\ \sin x=-1 \Rightarrow y=\frac{1}{4}\end{cases} \Rightarrow y=[-\frac{3}{2},\frac{1}{4}]$

ب) $\Rightarrow \sin x=\frac{3y+1}{y-2} \Rightarrow -1\leq\frac{3y+1}{y-2}\leq 1 \Rightarrow y=[-\frac{3}{2},\frac{1}{4}]$

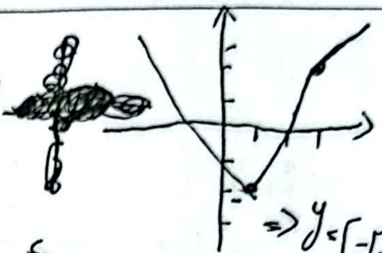
$y = \dfrac{(x-\frac{1}{2})^2}{\underbrace{(x-\frac{1}{2})^2}_{\text{+ صفر}} + \frac{3}{4}} \Rightarrow D_y = \mathbb{R}$

بازه حداقل و حداکثر $\Rightarrow (x-\frac{1}{2})^2 = 0 \Rightarrow y_{\text{حد}} = 0$

$(x-\frac{1}{2})^2 \Rightarrow +\infty \Rightarrow y_{\text{حد}} = 1$

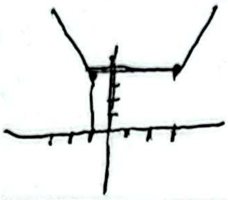
$\Rightarrow y = [0, 1)$ ۶

الف) $y = |2x-2| - |x-3| \Rightarrow \begin{cases} x+1 & x \geq 3 \\ 3x-5 & 1 \leq x \leq 3 \\ -x-1 & x < 1 \end{cases}$



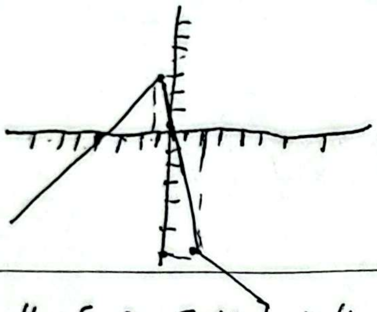
$\Rightarrow y = [-2, +\infty)$ ۷

ب) $|x-2| + |x+2| \xrightarrow{\text{نمودار}}$



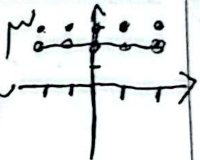
$\Rightarrow y \geq 4 \Rightarrow y = [4, +\infty)$

$y = |x-2| - |2x+2| \;,\; y \leq 1 \Rightarrow \begin{cases} x+4 & x \leq -1 \\ -3x-4 & -1 < x < 2 \\ -x-4 & x \geq 2 \end{cases}$ ۸

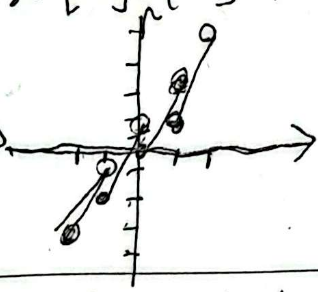


$y = (-\infty, -3] \cup [-\frac{1}{3}, +\infty)$

$y = [x] + [3-x] \Rightarrow y = [x] + [-x] + 3 \Rightarrow \begin{cases} x \in \mathbb{Z} \Rightarrow y = 3 \\ x \notin \mathbb{Z} \Rightarrow y = 2 \end{cases}$



$y = 3x - [x] \Rightarrow$ ۹



$y = \sin^2 x - \overbrace{\sin x}^{t} + 1 \Rightarrow \begin{cases} t = 1 \Rightarrow y = 1 \\ \frac{-b}{2a} = \frac{1}{2} \Rightarrow t = \frac{1}{2} \Rightarrow y = \frac{3}{4} \\ t = -1 \Rightarrow y = 3 \end{cases} \Big| \cap \Rightarrow y = [\frac{3}{4}, 3]$ ۱۰

$y = \sin^4 x + \underbrace{\sin^2 x}_{t} + 1 \quad \begin{cases} t = 1 \Rightarrow y = 3 \\ \frac{-b}{2a} = -\frac{1}{2} \Rightarrow y = \frac{3}{4} \\ t = 0 \Rightarrow y = 1 \end{cases} \Big| \cap \Rightarrow y = [1, 3]$