نام و نام خانوادگی ....آروین خالقی‌وردی.... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

۱۹٫۵ آفرین !

۱	۲	$xy - y = x^2 + x + 2 \Rightarrow$ [illegible] $xy - y = x^2 + x + 2$ $\Rightarrow x^2 + (1-y)x + y + 2 = 0$ [illegible] $\Delta \geq 0 : y^2 - 2y + 1 - 4y - 8 \geq 0$ $\Rightarrow y^2 - 6y - 7 \geq 0 \Rightarrow (y+1)(y-7) \geq 0$ [illegible] $y = (-\infty, -1] \cup [7, +\infty)$
۲	۲	الف) $y = 2x^2 - 5x + 1 \xrightarrow{a>0} R = [y_{min}, +\infty)$ $x_v = \frac{5}{4} \Rightarrow y_{min} = -\frac{17}{8} \Rightarrow R = [-\frac{17}{8}, +\infty)$ ج) $y = \sqrt{x^4 - 2x^2 + 4x + 1} \Rightarrow R = [0, \text{[illegible]}] \longrightarrow R = [0, +\infty)$ [illegible] ب) $y = \sqrt{-x^2 + 6x - 5} \Rightarrow R = [0, \text{[illegible]}]$ $\Rightarrow x_v = 3 \Rightarrow y_{max} = 2 \Rightarrow R = [0, 2]$ د) $\longrightarrow$ [illegible] $\Rightarrow (0,]\ \mathbb{R}^+ \to \mathbb{R}$
۳	۲	الف) $y = \frac{3x+1}{2x-5}$ $y = \mathbb{R} - \{\frac{a}{c}\} \Rightarrow y = \mathbb{R} - \{\frac{3}{2}\}$ ب) $y = \sqrt{\frac{4x-1}{x-2}} \Rightarrow y \geq 0 , y \neq \frac{a}{c} \Rightarrow y = [0, 2) \cup (2, +\infty)$ 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) $y = x^2 + 4 + \frac{1}{x^2+4} - 4 \Rightarrow y \geq 4 + \frac{1}{4} - 4 \Rightarrow y \geq \frac{1}{4} \Rightarrow y = [\frac{1}{4}, +\infty)$
۴	۲	$y = \frac{3x^2 + 4}{x^2 - 1} \xrightarrow{\text{دو سر}} -4 , 3 \Rightarrow \longrightarrow y = (-\infty, -4] \cup [3, +\infty)$ $y = \frac{3x^2 + 4}{x^2 - 1} \xrightarrow{\text{وارون}} x^2 = \frac{y+4}{y-3} \geq 0$ $\begin{array}{ccc} -4 & & 3 \\ + & - & + \end{array}$ $y = (-\infty, -4] \cup [3, +\infty)$
۵	۲	$y = \frac{2\sin x - 1}{\sin x + 3} \longrightarrow \begin{array}{l} \sin x = 1 \Rightarrow y = -\frac{3}{2} \\ \sin x = -1 \Rightarrow y = \frac{1}{4} \end{array} \Bigg\vert \Rightarrow y = [-\frac{3}{2}, \frac{1}{4}]$ ب) $\Rightarrow \sin x = \frac{3y+1}{y-2} \Rightarrow -1 \leq \frac{3y+1}{y-2} \leq 1 \Rightarrow y = [-\frac{3}{2}, \frac{1}{4}]$

$y=\dfrac{(x-\frac{1}{2})^2}{(x-\frac{1}{2})^2+\frac{3}{4}}$ به ازای حداقل و حداکثر $(x-\frac{1}{2})^2=0 \Rightarrow y=0$

$\underbrace{(x-\frac{1}{2})^2+\frac{3}{4}}_{\text{همواره }+} \Rightarrow D_g=\mathbb{R}$ ، $(x-\frac{1}{2})^2 \to +\infty \Rightarrow y \to 1$ $\Rightarrow y=[0,1)$

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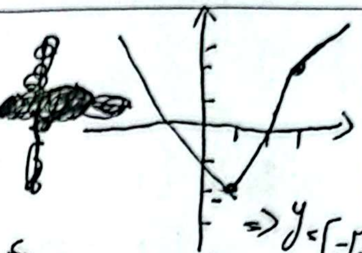
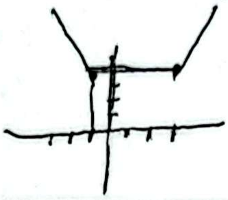
الف) $y=|2x-2|-|x-3| \Rightarrow \begin{cases} x+1 & x\geq 3 \\ 3x-5 & 1\leq x\leq 3 \\ -x-1 & x<1 \end{cases}$



$\Rightarrow y=[-2,+\infty)$

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



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

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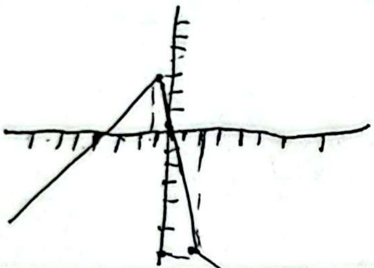
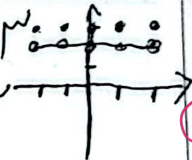
$y=|x-2|-|2x+2|$, $y\leq 1$ $\Rightarrow \begin{cases} x+4 & x\leq -1 \\ -3x-4 & -1<x<2 \\ -x-4 & x\geq 2 \end{cases}$



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

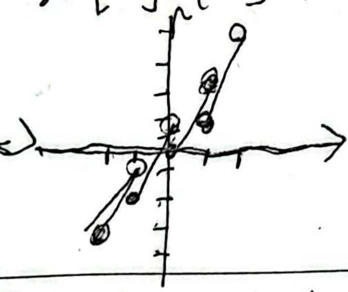
۲ ۸

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



$R_y=\{2,3\}$

$y=3x-[x] \Rightarrow$



$R_y=[-4,5)$

۱٫۵ ۹

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

۲ ۱۰

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