باران کاظمی　　یازدهم C　　تکلیف شماره ی ۷　　۱۹,۵

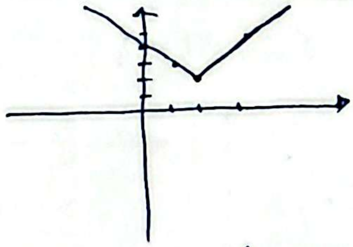
-۱ 　۲

الف) $y = x + |2x - 4|$

2	
$x - 2x + 4$	$x + 2x - 4$
$-x + 4$	$3x - 4$

$\begin{vmatrix} 1 \\ 3 \end{vmatrix}$ $\begin{vmatrix} 2 \\ 2 \end{vmatrix}$ $\begin{vmatrix} 3 \\ 5 \end{vmatrix}$

$R_y = [2, +\infty)$

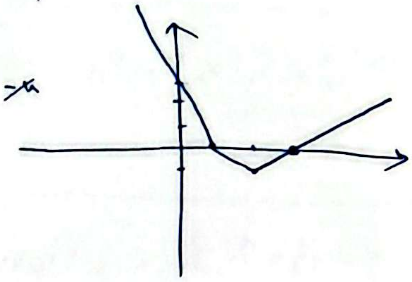


ب) $y = |x - 2| + |x - 1| - |x|$

0	1	2	
$-x+2-x+1+x$	$-x+2-x+1-x$	$-x+2+x-1-x$	$x-2+x-1-x$
$-x+3$	$-3x+3$	$-x+1$	$x-3$

$\begin{vmatrix} 0 \\ 3 \end{vmatrix}$ $\begin{vmatrix} 1 \\ 0 \end{vmatrix}$ $\begin{vmatrix} 2 \\ -1 \end{vmatrix}$ $\begin{vmatrix} 3 \\ 0 \end{vmatrix}$

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



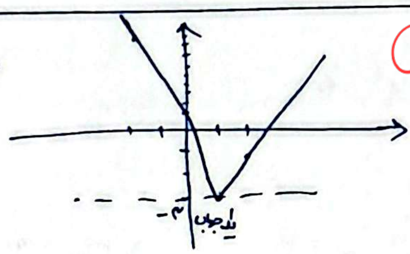
-۲ 　۲

$|3x - 3| - |x + 2| = k$

-2	1	
$-3x+3+x+2$	$-3x+3-x-2$	$3x-3-x-2$
$-2x+5$	$-4x+1$	$2x-5$

$\begin{vmatrix} -3 \\ 11 \end{vmatrix}$ $\begin{vmatrix} -2 \\ 9 \end{vmatrix}$ $\begin{vmatrix} 1 \\ -3 \end{vmatrix}$ $\begin{vmatrix} 2 \\ -1 \end{vmatrix}$

$k = -3$

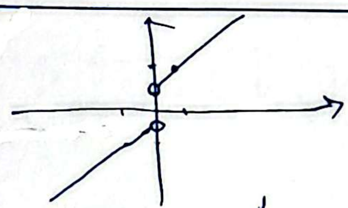


-۳ 　۲

الف) $y = x + \dfrac{x}{|x|}$

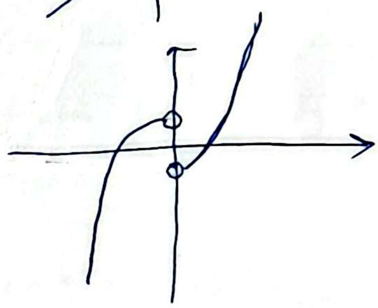
0	
$x - 1$	$x + 1$

$\begin{vmatrix} -1 \\ -2 \end{vmatrix}$ $\begin{vmatrix} 1 \\ 2 \end{vmatrix}$



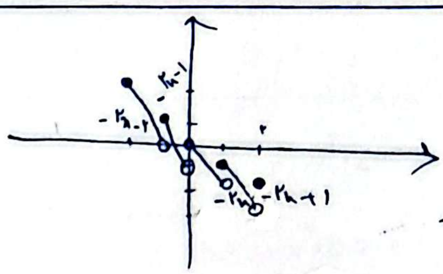
ب) $y = x|x| - \dfrac{x}{|x|}$

0	
$-x^2 + 1$	$x^2 - 1$



-۴ 　$[-2, 2)$ 　۲

الف) $y = [x] - 2x$



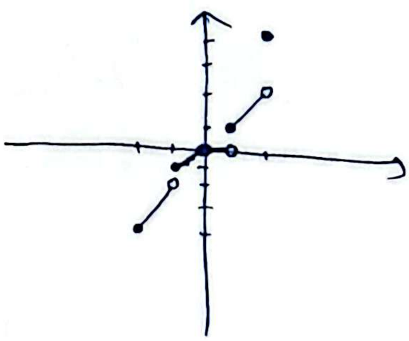
ب) $y = [x]|x|$

$[-2, -1) \to [x] = -2 \to 2x$

$[-1, 0) \to [x] = -1 \to x$

$[0, 1) \to [x] = 0 \to 0$

$[1, 2) \to x$



۵-

الف) $y=3x-[3x]$

$0\le x-[x]<1 \Rightarrow 0\le 3x-[3x]<1$ $\boxed{R_y=[0,1)}$

ب) $y=4x-4[x]$ $0\le x-[x]<1 \Rightarrow 0\le 4x-4[x]<4$ $\boxed{R_y=[0,4)}$

ج) $y=x-5[\frac{x}{5}] \Rightarrow 5(\frac{x}{5}-[\frac{x}{5}])$ $0\le \frac{x}{5}-[\frac{x}{5}]<1 \Rightarrow 0\le 5(\frac{x}{5}-[\frac{x}{5}])<5$ ۵

$\boxed{R_y=[0,5)}$

د) $y=[2x]-2x$ $-1<[2x]-2x\le 0$ $\boxed{R_y=(-1,0]}$

---

۵ ۶-

الف) $y=3\sin x+2\cos x$ $-\sqrt{9+4}\le 3\sin x+2\cos x\le\sqrt{9+4}$

$-\sqrt{13}\le 3\sin x+2\cos x\le\sqrt{13} \Rightarrow R_y=[-\sqrt{13},\sqrt{13}]$

ب) $y=4\sin x-3\cos x$ $-\sqrt{25}\le 4\sin x-3\cos x\le\sqrt{16+9}$

$\Rightarrow -5\le 4\sin x-3\cos x\le 5 \Rightarrow R_y=[-5,5]$

ج) $y=[2\sin x+5\cos x]$ $-\sqrt{29}\le 2\sin x+5\cos x\le\sqrt{29} \Rightarrow R_y=\{-6,-5,-4,-3,-2,-1,0,1,2,3,4,5\}$

$-6\le[2\sin x+5\cos x]\le 5$

د) $y=\sqrt{\cos x-2\sin x}$ $-\sqrt{5}\le \cos x-2\sin x\le\sqrt{5} \Rightarrow 0\le\sqrt{\cos x-2\sin x}\le\sqrt[4]{5} \Rightarrow R_y=[0,\sqrt[4]{5}]$

---

۵ ۷-

الف) $y=\sin^2x+3\sin x+2$

$-1\Rightarrow 1-3+2=0$

$1\Rightarrow 1+3+2=6$

$-\frac{b}{2a}=-\frac{3}{2}$ $-1\le\sin x \Rightarrow \sin x=-\frac{3}{2}$ غ ق ق

$R_y=[0,6]$

ب) $y=2\sin^2x+3\sin x+2$

$-1\to 2-3+2=1$

$1\to 2+3+2=7$

$-\frac{b}{2a}=-\frac{3}{4} \Rightarrow 2(\frac{9}{16})+3(-\frac{3}{4})+2=\frac{9-18+16}{8}=\frac{7}{8}$

$R_y=[\frac{7}{8},7]$

---

۵ ۸-

الف) $y=\sin^2x+4\cos^2x=1-\cos^2x+4\cos^2x=3\underbrace{\cos^2x}_{[0,1]}+1$

$0\le\cos^2x\le1 \Rightarrow 0\le 3\cos^2x\le 3 \Rightarrow 1\le 3\cos^2x+1\le 4$ $R_y=[1,4]$

ب) $y=\frac{2\cot x}{1+\cot^2x}=\frac{\frac{2\cos x}{\sin x}}{\frac{1}{\sin^2x}}=2\cos x\sin x=\sin 2x$ $R_y=[-1,1]$

۹-

الف) $y = \sin^4 x + \cos^4 x \Rightarrow 2^{-1} \le \sin^{2(2)} x + \cos^{2(2)} x \le 1 \Rightarrow \frac{1}{2} \le \sin^4 + \cos^4 \le 1$ ۱,۷۵

$R_y = [\frac{1}{2}, 1]$

ب) $y = [\sin^8 x + \cos^8 x] \Rightarrow 2^{-3} \le \sin^{2(4)} x + \cos^{2(4)} x \le 1 \Rightarrow \frac{1}{8} \le \sin^8 x + \cos^8 x \le 1$

$0 \le [\sin^8 x + \cos^8 x] \le 1 \Rightarrow R_y = \cancel{[0,1]}$ $\{0,1\}$

۱۰-

الف) $y = \frac{2x^2+7x-4}{x+4} = \frac{\cancel{(x+4)}(2x-1)}{\cancel{(x+4)}}$ $R_y = \mathbb{R} - \{-9\}$ ۱,۷۵

$$\begin{array}{l|l} 2x^2+7x-4 & x+4 \\ \hline -2x^2 \mp 8x & 2x-1 \\ \hline -x-4 & \\ +x+4 & \\ \hline 0\ 0 & \end{array}$$

$= 2x-1 \rightarrow -8-1 = -9$

ب) $y = \frac{x^3-1}{x-1} = \frac{\cancel{(x-1)}(x^2+x+1)}{\cancel{(x-1)}} = x^2+x+1 \Rightarrow$ $\rightarrow 1+1+1=3$

$\left| \begin{array}{l} -\frac{1}{2} \\ \frac{1}{4} - \frac{1}{2} + 1 = \frac{1-2+4}{4} = \frac{3}{4} \end{array} \right.$

$[\frac{3}{4}, +\infty) - \{\cancel{3}\}$