نام و نام خانوادگی .... پاسخنامه تشریحی تکلیف شماره ۷ ..... کلاس ....

۱۹,۷۵

۱

الف) $y = x + |2x-4|$

$x-2x+4$	$x+2x-4$
$-x+4$ (2)	$3x-4$

$R_y = [2, +\infty)$

ب) $y = |x-2| + |x-1| - |x|$

$\begin{bmatrix}0\\3\end{bmatrix}\begin{bmatrix}1\\0\end{bmatrix}\begin{bmatrix}2\\-1\end{bmatrix}\begin{bmatrix}3\\0\end{bmatrix}\begin{bmatrix}4\\1\end{bmatrix}\begin{bmatrix}-1\\4\end{bmatrix}$

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

۲

۲

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

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

لذا $x=1$

$|3-3| - |1+2| = -3 \rightarrow k=-3$

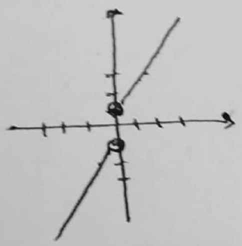
۲

۳

الف) $y = x + \dfrac{x}{|x|}$

$x-1$	$x+1$

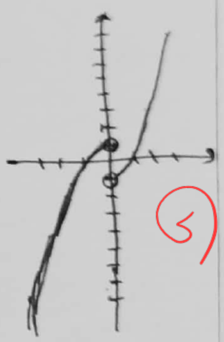
$\begin{bmatrix}-1\\-2\end{bmatrix}\begin{bmatrix}-2\\-3\end{bmatrix}\begin{bmatrix}1\\2\end{bmatrix}\begin{bmatrix}2\\3\end{bmatrix}$



ب) $y = x|x| - \dfrac{x}{|x|}$

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

$\begin{bmatrix}-1\\0\end{bmatrix}\begin{bmatrix}-2\\-3\end{bmatrix}\begin{bmatrix}-3\\-8\end{bmatrix}\begin{bmatrix}1\\0\end{bmatrix}\begin{bmatrix}2\\3\end{bmatrix}\begin{bmatrix}3\\8\end{bmatrix}$



۲

۴

الف) $y = [x] - 2x$

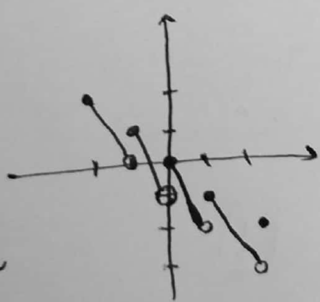
$x=2 \rightarrow y=-2$

$1 \le x < 2 \rightarrow 1-2x$

$0 \le x < 1 \rightarrow -2x$

$-1 \le x < 0 \rightarrow -2x-1$

$-2 \le x < -1 \rightarrow -2x-2$



ب) $[x]|x|$

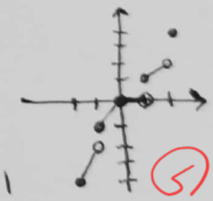
$x=2 \rightarrow y=4$

$1 \le x < 2 \rightarrow |x|$

$0 \le x < 1 \rightarrow 0$

$-1 \le x < 0 \rightarrow -|x|$

$-2 \le x < -1 \rightarrow -2|x|$



۲

۵

الف) $y = 3x - [3x]$

$0 \le x - [x] < 1$

$R_f = [0, 1)$

ب) $4x - 4[x]$

$4(x - [x]) \rightarrow [0, 4)$

ج) $y = x - 5\left[\dfrac{x}{5}\right]$

$5\left(\dfrac{x}{5}\right) \rightarrow 5\left(\dfrac{x}{5} - \left[\dfrac{x}{5}\right]\right)$

$R_f = [0, 5)$

د) $y = [2x] - 2x$ $\quad -1 < [x] - x \le 0$

$R_f = (-1, 0]$

۲

الف) $y = 3\sin x + 4\cos x$

$-\sqrt{9+16} \le 3\sin x + 4\cos x \le \sqrt{9+16}$

$[-\sqrt{25}, \sqrt{25}] = R_f$

ب) $y = 4\sin x - 3\cos x \quad R_f = [-5, 5]$

$-\sqrt{16+9} \le 4\sin x - 3\cos x \le \sqrt{16+9}$

ج) $y = [3\sin x + 5\cos x]$

$-\sqrt{9+25} \le 3\sin x + 5\cos x \le \sqrt{9+25}$

$-\sqrt{25} \le y \le \sqrt{25}$

$[y] \to \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5\}$

R_f

د) $\sqrt{\cos x - 2\sin x} \quad R_f = [0, 4\sqrt{5}]$

$-\sqrt{1+4} \le \cos x - 2\sin x \le \sqrt{5}$

1,15

الف) $y = \sin^2 x + 2\sin x + 2$

$R_f = [0, 9]$

ب) $y = 2\sin^2 x + 2\sin x + 2$

$R_f = \left[\frac{7}{8}, 7\right]$

الف) $\sin^2 x + 4\cos^2 x$

$(1 - \sin^2 x)$

$\sin^2 x + 4 - 4\sin^2 x = 4 - 3\sin^2 x$

$R_f = [1, 4]$

ب) $y = \frac{2\cot x}{1 + \cot^2 x}$

$1 + \cot^2 x \neq 0$

$\cot x \to 1 \to -1$

$R_f = [-1, 1]$

الف) $y = \sin^6 x + \cos^6 x$

$2^{1-2} \le y \le 1$

$\frac{1}{4} \le y \le 1$

$R_f = [\frac{1}{4}, 1]$

ب) $y = [\sin^8 x + \cos^8 x]$

$2^{1-4} \le \sin^{2(4)} x + \cos^{2(4)} x \le 1$

$\frac{1}{8} \le \sin^8 x + \cos^8 x < 1$

$R_f = \{1, 0\}$

الف) $y = \frac{3x^2 + 7x - 4}{x + 4}$

$\frac{(x+4)(3x-1)}{x+4} = 3x - 1$

$x \neq -4 \to y \neq -9$

$R_f = \mathbb{R} - \{-9\}$

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

$\to x^2 + x + 1 \to [\frac{3}{4}, +\infty)$

$x \neq 1 \Rightarrow y \neq 3$

$R_f = [\frac{3}{4}, +\infty)$