۷ تکلیف

یازدهم دختران C

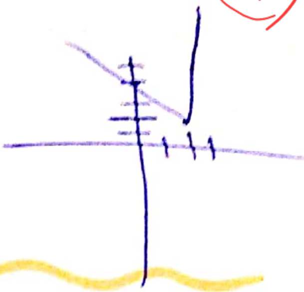
کار ریاضی

۲۰

1

الف) $y = x + |2x - 4|$

$x<2$	$x>2$
$x - 2x + 4$	$x + 2x - 4$
$-x + 4$	$3x - 4$



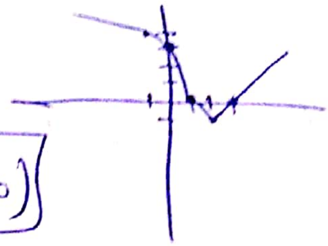
$\boxed{R_f = [2, +\infty)}$

۲

ب) $y = |x - 2| + |x - 1| - |x|$

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

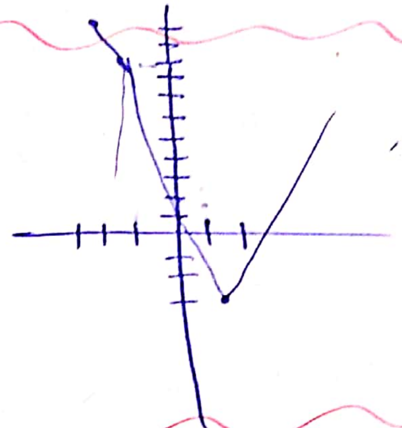
$\boxed{R_f = [-1, +\infty)}$



2

$y = |3x - 3| - |x + 2| = 4$

$x<-2$	$-2<x<1$	$x>1$
$-2x + 5$	$-4x + 1$	$2x - 5$



k باید مقداری باشد تا یک بار با نمودار برخورد داشته باشد ⇐ نقطه $(1, -3)$

$\boxed{k = -3}$

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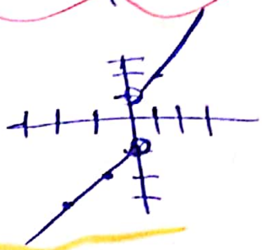
3

الف) $y = x + \dfrac{x}{|x|} \longrightarrow \begin{cases} x + 1 & x > 0 \\ x - 1 & x < 0 \end{cases}$



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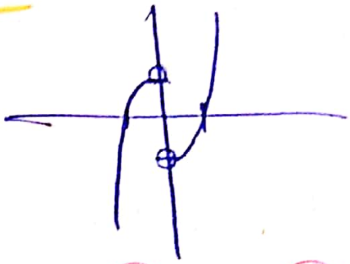
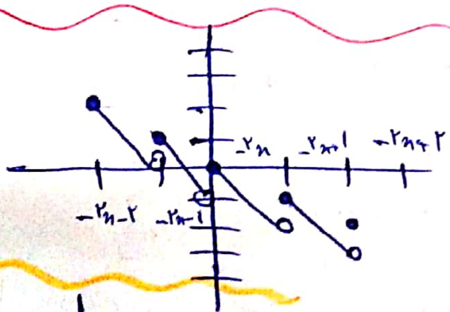
ب) $y = x|x| - \dfrac{x}{|x|} \longrightarrow \begin{cases} x^2 - 1 & x > 0 \\ -x^2 + 1 & x < 0 \end{cases}$



4

الف) $y = [x] - 2x$



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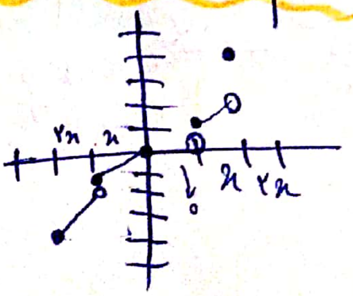
ب) $y = [x]|x|$



5

الف) $y = 3x - [3x] \longrightarrow \boxed{R_f = [0,1)}$

ب) $y = 4x - 4[x] \rightarrow 4(\underbrace{x-[x]}_{0 \le x-[x] < 1}) \rightarrow \boxed{R_f = [0,4)}$ ۳

ج) $y = x - 5\left[\frac{x}{5}\right] \rightarrow 5\left(\underbrace{\frac{x}{5} - \left[\frac{x}{5}\right]}_{0 \le \frac{x}{5} - \left[\frac{x}{5}\right] < 1}\right) \rightarrow \boxed{R_f = [0,5)}$

د) $[2x] - 2x \longrightarrow \boxed{R_f = (-1,0]}$

6

الف) $y = 3\sin x + 2\cos x$

$-\sqrt{9+4} \le 3\sin x + 2\cos x \le \sqrt{9+4} \rightarrow \boxed{R_f = [-\sqrt{13}, \sqrt{13}]}$ ۳

ب) $y = 4\sin x - 3\cos x$

$4\sin x + (-3\cos x)$

$-\sqrt{16+9} \le 4\sin x + (-3\cos x) \le \sqrt{16+9} \longrightarrow \boxed{R_f = [-5,5]}$

ج) $y = [2\sin x + 5\cos x]$

$-\sqrt{25+4} \le 2\sin x + 5\cos x \le \sqrt{25+4} \longrightarrow \boxed{R_f = \{-6,-5,\dots,4,5\}}$

د) $y = \sqrt{\cos x - 2\sin x} = \sqrt{\cos x + (-2\sin x)}$

$-\sqrt{5} \le \cos x + (-2\sin x) \le \sqrt{5} \xrightarrow{\text{رادیکال}} \boxed{R_f = [0, \sqrt{5}]}$

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الف) $y = \sin^2 x + 3\sin x + 2$ ۲

$\sin x = -1 \to y = 0$

$\sin x = 1 \to y = 6$

$\sin x = -\frac{3}{2} \to \times$

$\boxed{R_f = [0,6]}$

ب) $y = 2\sin^2 x + 3\sin x + 2$

$\sin x = -1 \to y = 1$

$\sin x = 1 \to y = 7$

$\sin x = -\frac{3}{4} \to y = \frac{7}{8}$

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

۸

الف) $y = \sin^2 x + \underbrace{4\cos^2 x}$ $\to \sin^2 x + 4 - 4\sin^2 x = -3\underbrace{\sin^2 x} + 4$ ۲

$4\sin^2 x + 4\cos^2 x = 4$

$4\cos^2 x = 4 - 4\sin^2 x$

$0 \leq \sin^2 x \leq 1$

$\to \boxed{R_f = [1,4]}$

ب) $y = \frac{2\cot x}{\underbrace{1+\cot^2 x}_{\frac{1}{\sin^2 x}}} = \frac{\frac{2\cos x}{\sin x}}{\frac{1}{\sin^2 x}} = 2\cos x \sin x = \sin(2x) \to \boxed{R_f = [-1,1]}$

۹

الف) $y = \sin^4 x + \cos^4 x$

$2^{1-k} \leq \sin^{2k} x + \cos^{2k} x \leq 1$

$\frac{1}{2} \leq \sin^4 x + \cos^4 x \leq 1 \to \boxed{R_f = [\frac{1}{2}, 1]}$ ۲

ب) $y = [\sin^8 x + \cos^8 x]$

$\frac{1}{8} = 2^{-3} \leq \sin^8 x + \cos^8 x \leq 1 \xrightarrow{\text{براکت}} \boxed{R_f = \{0,1\}}$

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الف) $y=\frac{2x^2+7x-4}{x+4}$

$2x^2+7x-4=y \to 4x^2+14x-8=2y$

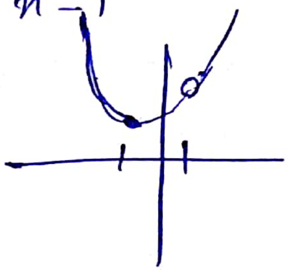
$(2x+8)(2x-1)=2y \to y=(x+4)(x-1)$

$\frac{(x+4)(2x-1)}{x+4}=2x-1 \to R=\mathbb{R} \to \boxed{R_f=\mathbb{R}-\{-9\}}$

۴- نداریم در D پس در R نداریم $\leftarrow x+4$

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

$D_f=\mathbb{R}-\{1\}$



$y=x^2+1+x$

$\hookrightarrow ext\left|\begin{matrix}-\frac{1}{2}\\ \frac{3}{4}\end{matrix}\right.$

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