۲۰

نام و نام خانوادگی ...علیا خوش‌بین... پاسخنامه تشریحی تکلیف شماره ...۷... کلاس ...یازدهم تجربی B...

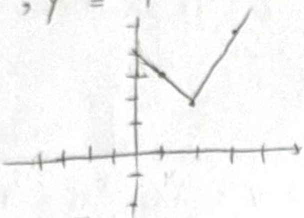
۱ — ۲

الف) $y = x + |2x - 4|$

$2x - 4 = 0 \to x = 2 \ , \ y = 2$

$x = 1 \ , \ y = 3$

$x = 3 \to y = 5$



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

$R_f = [2, +\infty)$

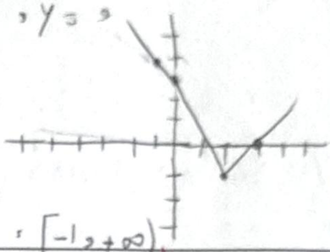
ب) $|x - 2| + |x - 1| - |x|$

$x - 2 = 0 \to x = 2 \ , \ y = -1$

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

$x = 0 \ , \ y = 3$

x	-1	0	1	2	3
y	4	3	0	-1	0



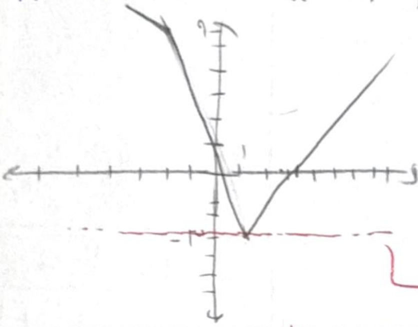
$R_f = [-1, +\infty)$

۲ — ۲

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

$x + 2 = 0 \to x = -2 \ , \ 3x - 3 = 0 \to x = 1$

	-2		1	
$2x + 5$		$-4x + 1$		$2x - 5$
	9		-3	



برای اینکه یک ریشه داشته باشد باید فقط یکبار نمودار را قطع کند که در نقطه $y = -3$ نمودار فقط یکبار قطع می‌شود

$k = -3$

۳ — ۲

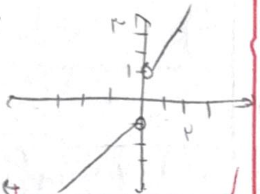
الف) $y = x + \dfrac{x}{|x|}$

$x > 0 = x + 1 \to \begin{vmatrix} 0 \\ 1 \end{vmatrix}$

$x < 0 = x - 1 \to \begin{vmatrix} 0 \\ -1 \end{vmatrix}$

$x + 1 = y \to x = 2, y = 3 \ \begin{vmatrix} 2 \\ 3 \end{vmatrix}$

$x - 1 = y \to x = -1, y = -2 \ \begin{vmatrix} -1 \\ -2 \end{vmatrix}$

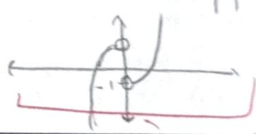


← دو خط موازی هم هستند

ب) $y = x|x| - \dfrac{x}{|x|}$

$x > 0 \to x^2 - 1 \to x = 0 , y = -1 \ \begin{vmatrix} 0 \\ -1 \end{vmatrix}$

$x < 0 \to -x^2 + 1 \to x = 0 , y = 1 \ \begin{vmatrix} 0 \\ 1 \end{vmatrix}$



← سهمی

۴ — ۲

الف) $y = [x] - 2x$

$0 \le x < 1 \to [x] = 0 \ , \ 1 \le x < 2 \to [x] = 1$

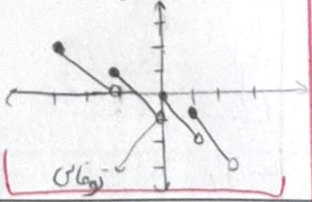
$-1 \le x < 0 \to [x] = -1 \ , \ -2 \le x < -1 \to [x] = -2$

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

$1 \le x < 2 \to -2x + 1$

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

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



(نزولی)

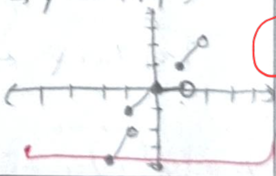
ب) $y = [x]\,|x|$

$-2 \le x < -1 \to [x] = -2 \to y = -2|x|$

$0 \le x < 1 \to [x] = 0 \to y = 0$

$1 \le x < 2 \to [x] = 1 \to y = |x|$

$-1 \le x < 0 \to [x] = -1 \to y = -|x|$



۵ — ۲

الف) $y = 3x - [3x] \to 0 \le y - [y] < 1$

$y = 3x \to 0 \le 3x - [3x] < 1$

$R_f = [0, 1)$

ب) $y = 4x - 4[x] = 4(x - [x])$

$0 \le x - [x] < 1 \to 0 \le 4(x - [x]) < 4$

$R_f = [0, 4)$

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

$0 \le \dfrac{x}{5} - \left[\dfrac{x}{5}\right] < 1 \times \to R_f = [0, 5)$

د) $y = [2x] - 2x = -(2x - [2x])$

$0 \le 2x - [2x] < 1 \times - = R_f = (-1, 0]$

	الف	ب	
۶	الف) $y = 3\sin x + 2\cos x$ $-\sqrt{9+4} \le 3\sin x + 2\cos x \le \sqrt{9+4}$ $R_f = [-\sqrt{13}, \sqrt{13}]$	ب) $y = 4\sin x - 3\cos x$ $-\sqrt{16+9} \le 4\sin x - 3\cos x \le \sqrt{16+9}$ $R_f = [-5, 5]$	۵
	ج) $y = [2\sin x + 5\cos x]$ $-\sqrt{25+4} \le 2\sin x + 5\cos x \le \sqrt{25+4} \to [-\sqrt{29}, \sqrt{29}]$ $= R_f = [-4, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5]$	د) $y = \sqrt{\cos x - 2\sin x}$ $-\sqrt{1+4} \le \cos x - 2\sin x \le \sqrt{1+4} \to [-\sqrt{5}, \sqrt{5}]$ $\sqrt{[-\sqrt{5}, \sqrt{5}]} = [0, \sqrt[4]{5}] = R_f$	
۷	الف) $y = \sin^2 x + 3\sin x + 2$ $max \to \sin x = 1 + 3 + 2 = 6$ $min \to \sin x = 1 - 3 + 2 = 0$ $\frac{-b}{2a} = \frac{-3}{2} =$ غ ق ق $\to \sin x \ne \frac{-3}{2}$ $R_f = [0, 6]$	ب) $y = 2\sin^2 x + 3\sin x + 2$ $max \to \sin x = 2 + 3 + 2 = 7$ $min \to \sin x = 2 - 3 + 2 = 1$ $\frac{-b}{2a} = \frac{-3}{4} = \frac{9}{8} - \frac{9}{4} + 2 = \frac{7}{8}$ $R_f = [\frac{7}{8}, 7]$	۵
۸	الف) $y = \sin^2 x + 4\cos^2 x$ $\cos^2 x = 1 - \sin^2 x \to \sin^2 x - 4\sin^2 x + 4 =$ $-3\sin^2 x + 4 \to min\ \sin x = 0 = 4$ $max\ \sin x = 1 = 1$ $R_f = [1, 4]$	ب) $y = \frac{2\cot x}{1 + \cot^2 x} = \frac{\frac{2\cos x}{\sin x}}{\frac{1}{\sin^2 x}} =$ $2\sin x \cos x = \sin 2x \to [-1, 1]$ $R_f = [-1, 1]$	۵
۹	الف) $y = \sin^6 x + \cos^6 x \to 2k = 6 \to k = 3$ $2^{1-3} \le \sin^6 x + \cos^6 x \le 1 \to \frac{1}{4}, 1$ $R_f = [\frac{1}{4}, 1]$	ب) $y = [\sin^8 x + \cos^8 x]\ 2k = 8 \to k = 4$ $2^{1-4} \le \sin^8 x + \cos^8 x \le 1 \to [\frac{1}{8}, 1]$ $[\frac{1}{8}] = 0\ ,\ [1] = 1$ $R_f = \{0, 1\}$	۵
۱۰	الف) $y = \frac{2x^2 + 7x - 4}{x + 4}$ $2x^2 + 7x - 4 \to x^2 + 7x - 8 = (x + \frac{8}{2})(x - \frac{1}{2}) =$ $\frac{(2x-1)\cancel{(x+4)}}{\cancel{(x+4)}} = 2x - 1 = y$ $R_f = \mathbb{R} - \{-9\}$ $x = -4$	ب) $y = \frac{x^3 - 1}{x - 1} = \frac{\cancel{(x-1)}(x^2 + 1 + x)}{\cancel{(x-1)}} =$ $x^2 + 1 + x = y$; $\Delta = b^2 - 4ac = -3$ $\Delta < 0, a > 0 \to$ مینیمم $\to \frac{-\Delta}{4a} = \frac{3}{4}$ $R_f = [\frac{3}{4}, +\infty)$	۵