Subject:
Date

[illegible]

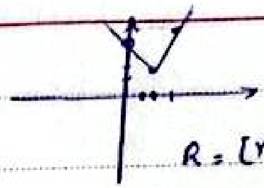
تکلیف شماره ۷ — یازدهم دخترانه B

۱- الف) $y = x + |2x - 4|$, $x = 2$ $\Rightarrow$

$-x+4$	۲	$3x-4$
	(۲)	

$x = 3 \to y = 5$

$x = 0 \to y = 4$



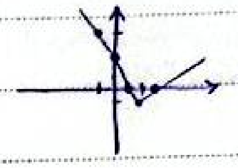
$R = [2, +\infty)$

ب) $y = |x-2| + |x-1| - |x|$ $\Rightarrow$

$-2x+3$	۰	$-3x+3$	۱	$-x+1$	۲	$x-3$
	(۳)		(۰)		(-۱)	

$x = 3 \to 0$

$x = -1 \to 5$



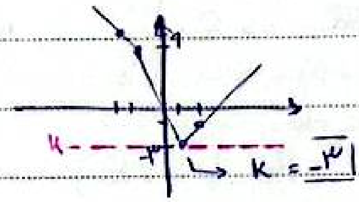
$R = [-1, +\infty)$

۲- ابتدا رسم کرده => به ازای مقدار K ، تابع در یک نقطه مشترک هستند.

$-2x+5$	-۲	$-4x+1$	۱	$2x-5$
	(۹)		(-۳)	

$x = 2 \to -1$

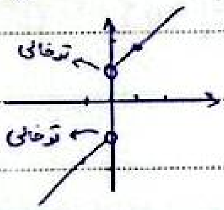
$x = -3 \to 11$



$K = -3$

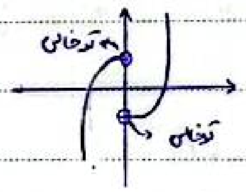
۳- الف) $y = x + \frac{x}{|x|}$

$x-1$	۰	$x+1$



ب) $y = x|x| - \frac{x}{|x|}$

$-x^2+1$	۰	x^2-1



۴- الف) $y = [x] - 2x$

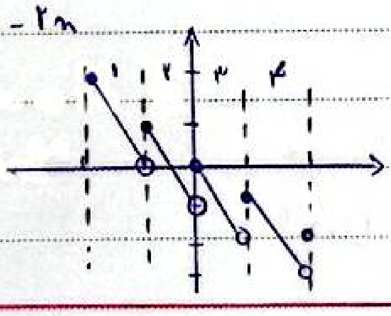
$1 \to -2 - 2x$

$2 \to -1 - 2x$

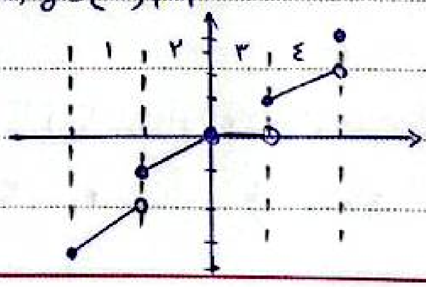
$3 \to 0 - 2x = -2x$

$4 \to 1 - 2x$

$x = 2 \to -2$



ب) $y = [x]|x|$



$1 \to -2|x|$

$2 \to -|x|$

$3 \to 0$

$4 \to |x|$

$x = 2 \to 4$

۵- الف) $y = 2x - [2x] \longrightarrow R = [0, 1)$

ب) $y = 4x - 4[x] = 4(x - [x]) \longrightarrow [0, 4)$, $x - [x] \in [0, 1)$

Subject:
Date

ج) $y = x - 5\left[\frac{x}{5}\right] = 5\left(\underbrace{\frac{x}{5}}_{[0,1)} - \left[\frac{x}{5}\right]\right) \longrightarrow R = [0, 5)$

د) $y = [2x] - 2x = -(\underbrace{2x}_{[0,1)} - [2x]) \longrightarrow R = (-1, 0]$

۹- $-\sqrt{a^2+b^2} \leq a\sin x + b\cos x \leq \sqrt{a^2+b^2}$

ا) $y = 3\sin x + 2\cos x \longrightarrow -\sqrt{13} \leq y \leq \sqrt{13} \Rightarrow R = [-\sqrt{13}, \sqrt{13}]$

ب) $y = 4\sin x - 3\cos x \longrightarrow -\sqrt{25} \leq y \leq \sqrt{25} \Rightarrow R = [-5, 5]$

ج) $y = [\underbrace{2\sin x + 5\cos x}_{t}] \longrightarrow -\sqrt{29} \leq t \leq \sqrt{29} \Rightarrow R = \begin{cases} -4 \\ -5 \\ -6 \\ \vdots \\ 5 \end{cases} \Rightarrow R = \{-4, -5, \ldots, 5\}$

د) $y = \sqrt{\underbrace{\cos x - 2\sin x}_{t}} \longrightarrow \sqrt{5} \leq t \leq \sqrt{5} \Rightarrow R = [0, \sqrt[4]{5}]$

۷- ا) $\sin^2 x + 3\sin x + 2$

$\sin x = 1 \longrightarrow y = 6 \qquad \sin x = \frac{-b}{2a} = \frac{-3}{2} \longrightarrow y = \frac{-1}{4} \Rightarrow R = [\frac{-1}{4}, 6]$

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

ب) $2\sin^2 x + 3\sin x + 2$

$\sin x = 1 \longrightarrow y = 7 \qquad \sin x = \frac{-b}{2a} = \frac{-3}{4} \longrightarrow y = \frac{7}{8} \Rightarrow R = [\frac{7}{8}, 7]$

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

۸- ا) $y = \sin^2 x + 4\cos^2 x = \sin^2 x + 4(1 - \sin^2 x) = -3\sin^2 x + 4$

$\sin x = \pm 1 \longrightarrow 1 \qquad \sin x = \frac{-b}{2a} = 0 \longrightarrow 4 \Rightarrow R = [1, 4]$

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

۹- $2^{1-k} \leq \sin^{2k} x + \cos^{2k} x \leq 1$

ا) $y = \sin^2 x + \cos^2 x$

$k=3 \longrightarrow 2^{-2} \leq y \leq 1 \Rightarrow R = [\frac{1}{4}, 1]$

ب) $y = [\sin^8 x + \cos^8 x]$

$k=4 \longrightarrow 2^{-3} \leq \sin^8 x + \cos^8 x < 1 \Rightarrow \frac{1}{8} \leq \sin^8 x + \cos^8 x < 1$ برالت $\Rightarrow R = \{0, 1\}$

۱۰- ا) $y = \frac{2x^2 + 7x - 3}{x+3}$

$2x^2 + 7x - 3 \mid x+3$

$2x^2 + 6x \quad\quad 2x - 1$

$-x - 3$

$-x - 3$

0

$\Rightarrow$ if $x = -3 \longrightarrow y = 2(-3) - 1 = -7 \Rightarrow R = \mathbb{R} - \{-7\}$

ب ریشه مخرج

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

if $x = 1 \longrightarrow y = 3 \Rightarrow R = \mathbb{R} - \{3\}$

ب ریشه مخرج