SUBJECT:

DATA:

NUMBER: تکلیف سری ۹ — باران عسکری دهم ریاضی B

$y = x^2 - 5 \Rightarrow x = \pm\sqrt{y+5} \Rightarrow y+5 \geq 0 \Rightarrow y \geq -5 \qquad R_f = [-5, +\infty)$

$y = x^3 + 1 \Rightarrow x^3 = y - 1 \Rightarrow x = \sqrt[3]{y-1} \qquad R_f = \mathbb{R}$

$y = x^2 - 4x + 6 \quad \left(\frac{-4}{2}\right) \Rightarrow (x-2)^2 + 2 = y \Rightarrow y - 2 = (x-2)^2 \Rightarrow x = \pm\sqrt{y-2} + 2$

$R_f = [2, +\infty)$

$y = x^2 - 5x + 1 \Rightarrow x^2 - 5x + 1 - y = 0 \Rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{5 \pm \sqrt{25 - 4 + 4y}}{2} \qquad (b^2 - 4ac)$

$\Rightarrow 21 + 4y \geq 0 \qquad 21 \geq -4y \qquad \frac{-21}{4} \leq y \qquad R_f = \left[\frac{-21}{4}, +\infty\right)$

الف) $y = \frac{x^2 + 3}{x^2 - 2} \Rightarrow x^2 = \frac{2y+3}{y-1} \Rightarrow x = \pm\sqrt{\frac{2y+3}{y-1}} \Rightarrow$

	$-\frac{3}{2}$		1	
$+$	0	$-$	$\vert$	$+$

$\Rightarrow R_f = \left(-\infty, -\frac{3}{2}\right] \cup (1, +\infty)$

ب) $y = \frac{2|x| + 1}{|x| - 4} \Rightarrow |x| = \frac{4y+1}{y-2} \Rightarrow$

	$-\frac{1}{4}$		2	
$+$	0	$-$	$\vert$	$+$

$R_f = \left(-\infty, -\frac{1}{4}\right] \cup [2, +\infty)$

$y = \frac{1}{x^2 - 4x} \Rightarrow yx^2 - 4yx - 1 = 0 \Rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{4y \pm \sqrt{(-4y)^2 + 4y}}{2y}$

$\Rightarrow 16y^2 + 4y \geq 0 \longrightarrow 4y(4y+1) \geq 0$

	$-\frac{1}{4}$		0	
$+$	0	$-$	0	$+$

$2y \neq 0, \quad y \neq 0$

$\Rightarrow R_f = \left(-\infty, -\frac{1}{4}\right] \cup (0, +\infty)$

$y = x^2 - 6x + 2 \qquad \min \left| \begin{array}{l} \frac{-b}{2a} = \frac{6}{2} = 3 \\ y = -7 \end{array} \right. \qquad R_f = [-7, +\infty)$

$y = -x^2 + 4x + 2 \qquad \max \left| \begin{array}{l} \frac{-b}{2a} = \frac{-4}{-2} = 2 \\ y = 6 \end{array} \right. \qquad R_f = (-\infty, 6]$

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$y=\sqrt{x^2-6x+2}$ min $\left|\begin{array}{l} x=\frac{-b}{2a}=\frac{6}{2}=3 \\ y=-7 \end{array}\right.$ $R_f=\sqrt{[-7,+\infty)}=[0,+\infty)$

$y=\sqrt{-x^2+4x+10}$ max $\left|\begin{array}{l} x=\frac{-b}{2a}=\frac{-4}{-2}=2 \\ y=14 \end{array}\right.$ $R_f=\sqrt{(-\infty,14]}=[0,14]$

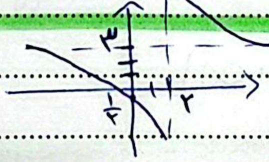
$y=x^7+3x^4+2x+1 \Rightarrow$ بزرگترین توان = فرد $=\mathbb{R}$

$y=\sqrt{x^5+4x^2+6x+1} \Rightarrow$ بزرگترین توان = فرد $=\sqrt{\mathbb{R}}=[0,+\infty)$

$y=\frac{3x+1}{x-2} \Rightarrow$ هموگرافیک $\Rightarrow \mathbb{R}-\frac{a}{c} \Rightarrow \mathbb{R}-\{3\}=R_f$

$y=\sqrt{\frac{4x+1}{x+3}} \Rightarrow$ هموگرافیک $\Rightarrow \sqrt{\mathbb{R}-\{4\}}=[0,+\infty)-\{2\}$

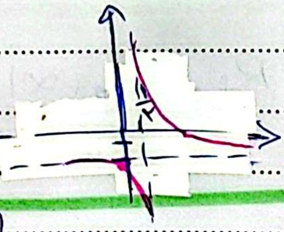
$y=\frac{3x+1}{x-2}$



مجانب قائم = ریشه مخرج ⟸ ۲

مجانب افقی ⟸ $y=\frac{a}{c}=3$

$y=\frac{4x-2}{1-2x}$



مجانب قائم ⟸ ریشه مخرج = $\frac{1}{2}$

افقی ⟸ $\frac{a}{c}=-2$ — $R_f=\mathbb{R}-\{-2\}$

الف) $y=\cos^2x+\frac{1}{\cos^2x} \Rightarrow R_f=[2,+\infty)$

$a+\frac{1}{a}$ $\begin{cases} a>0: [2,+\infty) \\ a<0: (-\infty,-2] \end{cases}$

ب) $y=\sqrt[3]{\frac{x^2+1}{x}}=\frac{x^2}{x}+\frac{1}{x}=x+\frac{1}{x} \Rightarrow R_f=(-\infty,-2]\cup[2,+\infty)$

SHAHAB