

مکتبہ علمیہ پور - روضہ شمسہ دہشت

الف) $\frac{|x|+1}{|x|-2} \quad \frac{D+1}{D-2} \quad 0 \leq D \rightarrow +\infty$

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

سوال 1

$0 = -\frac{1}{x} + 1 \Rightarrow 1 = \frac{1}{x} \Rightarrow x = 1$

$\Rightarrow |x| + \frac{1}{|x|} \rightarrow a + \frac{1}{a} \Rightarrow [2, +\infty)$

سوال 2

$(-\infty, -\frac{1}{x}] \cup (1, +\infty)$

$y = \frac{x^2+2x-2}{x+2} \Rightarrow yx + 2y = x^2 + 2x - 2$

$x^2 + (2-y)x - 2 - 2y = 0 \Rightarrow x = \frac{y-2 \pm \sqrt{(y-2)^2 - 4(-2-2y)}}{2}$

$y^2 + 4y + 12 \geq 0 \Rightarrow (-\infty, -4] \cup [-2, +\infty)$

$\frac{x^2-x+\frac{1}{x}}{x^2-x+1}$

$P_f = x^2 - x + 1 \neq 0 \Rightarrow \Delta < 0$
 $\Rightarrow D_f \subset \mathbb{R}$

سوال 3

$x^2 - x = 0 \Rightarrow [-\frac{1}{x} + \infty) \rightarrow x^2 - x = -\frac{1}{x} \Rightarrow 0$

$x^2 - x = +\infty \Rightarrow +1$

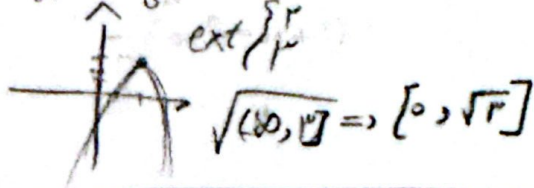
مفہم 50



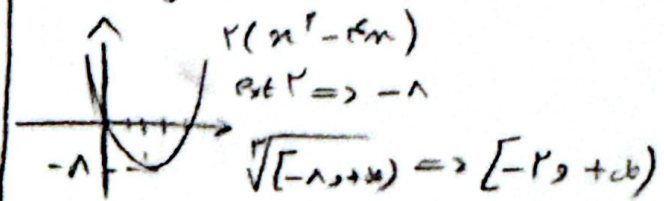
$\Rightarrow R \subset [0, 1)$

سوال 4

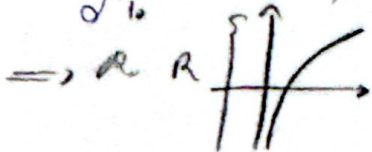
الف) $y = \sqrt{-x^2 + 4x - 1}$



ب) $y = \sqrt{2x^2 - 8x}$



الف) $\log(x^2 - x + 1)$



ب) $\log(\frac{x^2+1}{x})$

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

$x + \frac{1}{x} \Rightarrow [2, +\infty)$

الف) $|2x-1| - |x-3|$

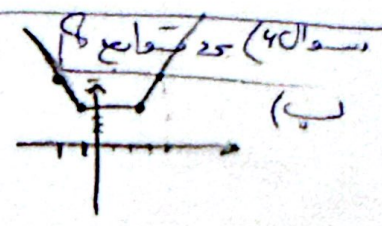
ب) $|x-3| + |x+1|$

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



$R_f = [-2, +\infty)$

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



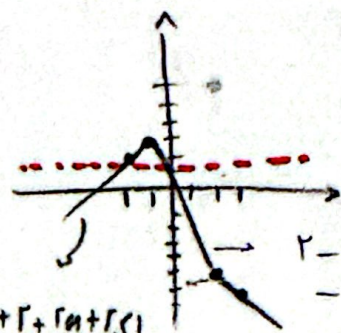
$R_f = [5, +\infty)$

$$|x-2| - |2x+2| \leq 1$$

راه دوم: استفاده

$$\begin{aligned} x+2 &\leq 1 \\ x &\leq -3 \\ -x+2-2x-2 &\leq 1 \\ -3x &\leq 1 \\ x &\geq -\frac{1}{3} \\ (III) \quad \left[-\frac{1}{3}, 2\right] & (II) \end{aligned}$$

$$I \cup II \cup III = (-\infty, -3] \cup \left[-\frac{1}{3}, +\infty\right)$$



مسئله ۷
راه اول: استفاده

$$\begin{aligned} 2 &\rightarrow -4 \\ -1 &\rightarrow 3 \\ -2 &\rightarrow 2 \\ 3 &\rightarrow -7 \end{aligned}$$

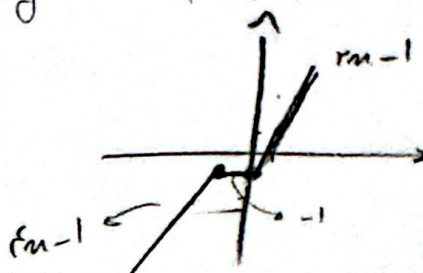
$$\begin{aligned} -x+2+2x+2 &\leq 1 \\ x+4 &\leq 1 \Rightarrow x \leq -3 \\ 2-x-2x-2 &\leq 1 \\ -3x &\leq 1 \Rightarrow x \geq -\frac{1}{3} \end{aligned}$$

جواب
لب $\left[-\frac{1}{3}, 2\right] \cup (-\infty, -3)$

$$y = 2x - |2x+1| + |x|$$

مسئله ۸) برد تابع

$$\begin{aligned} 0 &\rightarrow -1 \\ -\frac{1}{2} &\rightarrow -\frac{3}{2} + \frac{1}{2} \rightarrow -1 \\ 1 &\rightarrow 1 \quad -1 \rightarrow -3 \end{aligned}$$



$$R_f = \mathbb{R}$$

الف) $[x] + [3-x]$

$$[x] + [-x] + 3$$

گراف $[x] + [-x]$ را برای $x \rightarrow 0$ و $x \rightarrow -1$ رسم می‌کنیم.

$0+3=3$ $-1+3=2$

$$R = \{2, 3\}$$

ب) $3x - [x]$

مسئله ۹

گراف $3x - [x]$ را برای $x \rightarrow 0$ و $x \rightarrow -1$ رسم می‌کنیم.

$0-1 \rightarrow 0$
 $[1, 1) \rightarrow 1$
 $[0, 1) \rightarrow 0$
 $[-1, 0) \rightarrow -1$

$$R = [-1, 1)$$

مسئله ۱۰

الف) $\sin^2 x - \sin x + 1$

$1 \rightarrow 1$
 $-1 \rightarrow 3$
 $\frac{1}{2} \rightarrow \frac{3}{2}$

$$R = \left[\frac{3}{2}, 3\right]$$

ب) $\sin^2 x + \sin x + 1$

$1 \rightarrow 3$
 $0 \rightarrow 1$
 $-\frac{1}{2} \rightarrow \frac{3}{2}$

$$R = [1, 3]$$