Subject:

Year: Month: Day: ( ) B دوازدهم ریاضی تکلیف ۳ page:( )

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

$x=\frac{-(1-y)\pm\sqrt{(1-y)^2-4(2+y)}}{2}$ $\Delta\geq 0 \Rightarrow 1-2y+y^2-8-4y\geq 0 \Rightarrow y^2-6y-7\geq 0$ $\quad (y-7)(y+1)$ $\quad -1,\ 7:\ +\ -\ +$

$R_f=(-\infty,-1]\cup[7,+\infty)$

۲) الف) $y=2x^2-5x+1 \quad x_s=\frac{5}{4},\ y_s=2\times\frac{25}{16}-5\times\frac{5}{4}+1=\frac{25}{8}-\frac{25}{4}+1=\frac{25-50+8}{8}=-\frac{17}{8}$

$R_f=[-\frac{17}{8},+\infty)$

ب) $y=\sqrt{-x^2+6x-5} \quad x_s=\frac{-6}{-2}=3,\ y_s=-9+18-5=4 \quad R_f=\sqrt{(-\infty,4]}=[0,2]$

ج) $y=\sqrt{x^7-3x^3+4x+1} \Rightarrow R_f=\sqrt{R}=[0,+\infty)$

د) $\log(x^3-6x^2+7x+4) \Rightarrow R_f=(-\infty,+\infty)$

۳) الف) $y=\frac{3x+1}{2x-6} \Rightarrow R_f=R-\{\frac{3}{2}\}$

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

ج) $y=\frac{x^2+4}{\sqrt{x^2+3}} \xrightarrow{x^2=t} \frac{t+3+1}{\sqrt{t+3}}=\frac{t+3}{\sqrt{t+3}}+\frac{1}{\sqrt{t+3}} \Rightarrow \sqrt{t+3}+\frac{1}{\sqrt{t+3}}$ کمترین مقدار $\frac{4\sqrt{3}}{3}$ $\quad R_f=[\frac{4\sqrt{3}}{3},+\infty)$

د) $y=x^2+\frac{1}{x^2+4} \xrightarrow{x^2=t} t+\frac{1}{t+4}\ (+4-4) \rightarrow t+4+\frac{1}{t+4}-4 \xrightarrow{t=0} 4+\frac{1}{4}-4=\frac{1}{4}$; $t=\infty \rightarrow \infty$; $R_f=[\frac{1}{4},+\infty)$

۴) $y=\frac{3x^2+4}{x^2-1} \rightarrow$ ① $yx^2-y=3x^2+4 \rightarrow x^2(y-3)=4+y \Rightarrow x=\sqrt{\frac{4+y}{y-3}}$

② کمترین مقدار $x^2=0$: $\frac{4}{-1}=-4$ ، بیشترین مقدار $x^2=\infty$: $=3$ مخرج صفر نمی‌شود $(-\infty,-4]\cup(3,+\infty)$ $\quad -4,\ 3$

۵) $y=\frac{2\sin x-1}{\sin x+3} \rightarrow$ ① $y\sin x+3y=2\sin x-1 \Rightarrow \sin x(2-y)=3y+1 \quad (\div\ 2-y)$

$\sin x=\frac{3y+1}{-y+2} \Rightarrow -1\leq\frac{3y+1}{2-y}\leq 1 \Rightarrow$ I. $\frac{3y+1+2-y}{2-y}\geq 0 \quad \frac{2y+3}{2-y}\geq 0 \quad -\frac{3}{2},\ 2$

II. $\frac{3y+1-2+y}{2-y}\leq 0 = \frac{4y-1}{2-y}\leq 0 \quad \frac{1}{4},\ 2 \Rightarrow R_f=[-\frac{3}{2},\frac{1}{4}]$

روش ② $\sin x=1 \rightarrow y=\frac{1}{4}$

$\sin x=-1 \rightarrow y=-\frac{3}{2}$ → $[-\frac{3}{2},\frac{1}{4}]$

PAYCO

Subject:
Year: Month: Day: ( ) $D_f = R$ page: ( )

$f(x) = \frac{x^2 - x + \frac{1}{4}}{x^2 - x + 1}$ R_f: $yx^2 - yx + y = x^2 - x + \frac{1}{4} \rightarrow (y-1)x^2 - (y-1)x + y + \frac{1}{4}$ (۶

$x_s = \frac{y-1}{2(y-1)} = \frac{1}{2}$ $y_s = \frac{3}{4}y \rightarrow \left(\frac{3}{4}y, +\infty\right)$

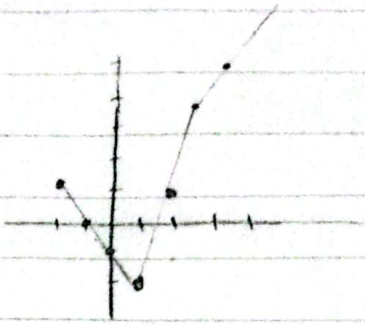
5

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

$x<1$	$1 \le x < 3$	$x \ge 3$
$-2x+2-x+3$	$2x-2-x+3$	$2x-2-x+3$
$-x-1$	$x-5$	$x+1$

$\begin{cases} -x-1 & x<1 \\ x-5 & 1 \le x < 3 \\ x+1 & x \ge 3 \end{cases}$

(۷

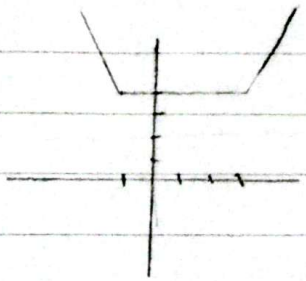


10

ب) $y = |x-3| + |x+1|$

$x<-1$	$-1 \le x < 3$	$x \ge 3$
$-x+3-x-1$	$x+3+x+1$	$x-3+x+1$
$-2x+2$	4	$2x-1$

$\begin{cases} -2x+2 & x<-1 \\ 4 & -1 \le x < 3 \\ 2x-1 & x \ge 3 \end{cases}$



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

$x<-1$	$-1 \le x < 2$	$x \ge 2$
$-x+2+2x+2 \le 1$	$-x+2-2x-2 \le 1$	$x-2-2x-2 \le 1$
$x+4 \le 1$	$-3x \le 1$	$-x-4 \le 1$
$x \le -3$ ✓	$x \ge -\frac{1}{3}$ ✗	$x > -5$ ✓
	$-1 < x < 2$	

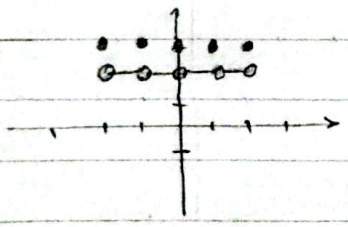
$(-\infty, -3] \cup \left[-\frac{1}{3}, +\infty\right)$

(۸

ب) $y = [x] + [3-x]$

$y = [x] + [-x] + 3$

$x \in \mathbb{Z}$ $y = 2$ ، $x \notin \mathbb{Z}$ $y = 3$



ب) $y = 3x - [x]$

$-2 < x < -1 \Rightarrow 3x + 2$

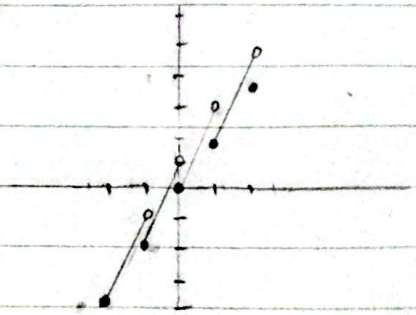
$-1 \le x < 0 \Rightarrow 2x + 1$

$0 \le x < 1 \Rightarrow 3x$

$1 \le x < 2 \Rightarrow 3x - 1$

$x = 2 \Rightarrow y = 4 - 2 = 2$

(۹



25

(۱۰

الف) $y = \sin^2 x - \sin x + 1$

$\sin x = 1 \quad y = 1$

$\sin x = -1 \quad y = 3$

$\sin x = \frac{1}{2} \quad y = \frac{3}{4}$ ($\frac{-b}{2a}$)

$R_f = \left\{\frac{3}{4}, 3\right\}$

ب) $y = \sin^4 x + \sin^2 x + 1$

$\sin^2 x = 1 \quad y = 3$

$\sin^2 x = 0 \quad y = 1$

$\sin^2 x = \frac{-1}{2}$ غ ق ق

$R_f = [1, 3]$

30

PAYCO