محمد عماد عطوبالی / دوازدهم تجربی A

(Green mark: ۱۷/۷۵)

۱- (Green mark: ۲)

$xy-y=x^2+x+2 \rightsquigarrow x^2+x-xy+y+2=0$

$x^2+x(1-y)+y+2=0$

$x=\frac{y-1\pm\sqrt{(1-y)^2-4(y+2)}}{2} \rightsquigarrow (1-y)^2-4(y+2)\geq 0$

$1+y^2-2y-4y-8\geq 0 \rightarrow y^2-6y-7\geq 0$

$(y-7)(y+1)\geq 0$ — sign table: -1, 7: $+\ -\ +$

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

۲- (Green mark: ۲)

الف) ext $\left|\begin{array}{l}\frac{5}{4}\\ 2\times\frac{25}{16}-\frac{25}{4}+1\rightarrow -\frac{17}{8}\end{array}\right.$

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

ب) ext $\left|\begin{array}{l}\frac{-6}{-2}=3\\ -9+18-5=4\end{array}\right.\rightarrow R_f=[0,2]$

ج) $R_f=[0,+\infty)$

د) $R_f=\mathbb{R}$

۳- (Green mark: ۲)

الف) $R_f=\mathbb{R}-\{\frac{3}{2}\}$

ب) $R_f=[0,+\infty)-\{2\}$

ج) $\sqrt{x^2+3}+\frac{1}{\sqrt{x^2+3}} \rightsquigarrow \min x=0$ (Green note: $\min t=\sqrt{3}$)

$=\sqrt{3}+\frac{1}{\sqrt{3}}=\frac{4}{\sqrt{3}} \Rightarrow R_f=[\frac{4}{\sqrt{3}},+\infty)$

د) $x^2+4+\frac{1}{x^2+4}-4 \quad \min x^2=0 \rightsquigarrow 4+\frac{1}{4}-4$

$\Rightarrow R_f=[\frac{1}{4},+\infty)$

۴- (Green mark: ۲)

$yx^2-y=3x^2+4 \rightarrow x^2(y-3)=4+y$

$x^2=\frac{4+y}{y-3} \rightarrow |x|=\sqrt{\frac{4+y}{y-3}} \rightarrow \frac{4+y}{y-3}\geq 0$

sign table: -4, 3: $+\ -\ +$ $\rightarrow R_f=(-\infty,-4]\cup(3,+\infty)$

$x^2=0 \rightarrow \frac{4}{-1}=-4$, $x^2=\infty^2 \rightarrow 3$ $\Big\}\ (-\infty,-4]\cup(3,+\infty)$

۵- (Green mark: ۲)

$y\mathcal{L}+3y=2\mathcal{L}-1 \rightarrow \mathcal{L}(2-y)=3y+1$

$\mathcal{L}=\frac{3y+1}{2-y} \rightarrow -1\leq\frac{3y+1}{2-y}\leq 1$

$y-2\leq 3y+1 \qquad 3y+1\leq 2-y$

$\frac{-3}{2}\leq y \qquad y\leq\frac{1}{4}$

$\Rightarrow R_f=[-\frac{3}{2},\frac{1}{4}]$

$\mathcal{L}=-1\rightarrow\frac{-3}{2}$, $\mathcal{L}=1\rightarrow\frac{1}{4}$ $\Big\}\ [-\frac{3}{2},\frac{1}{4}]$

۶- (Green mark: ۱/۷۵)

$D_f=\mathbb{R} \rightarrow$ در کل دامنه و مخرج، کسر هیچ وقت صفر نمیشه

(Green note: ضریب $x^2 \neq 0 \rightarrow y\neq 1$)

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

$\rightarrow x^2(1-y)+x(-1+y)+\frac{1}{4}-y$

(Green note: $R_f=[0,1)$)

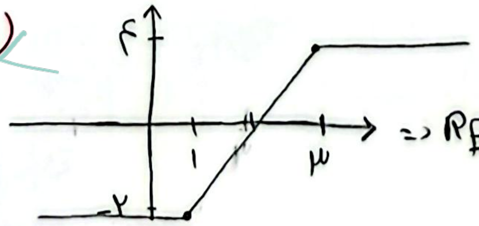
$\Delta\geq 0 \rightarrow (y-1)^2-4(1-y)(\frac{1}{4}-y)\geq 0$

$y^2+1-2y-1+4y+y-4y^2\geq 0 \qquad R_f=[0,1]$

$-3y^2+3y\geq 0 \rightarrow 3y(y-1)\leq 0$ — sign table: 0, 1: $+\ -\ +$

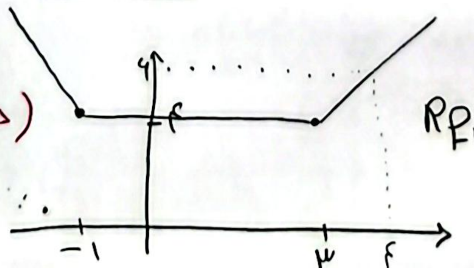
۷- (Green mark: ۱)

الف)



$\Rightarrow R_f=[-2,4]$

ب)

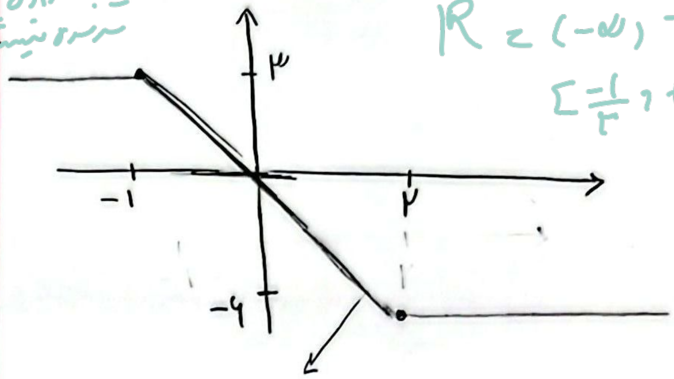


$R_f=[4,+\infty)$

۸- $y=|x-2|-|2x+2|$ (1)

ضریب داره [illegible] نیست !!!

$\mathbb{R} = (-\infty, -3] \cup [-\frac{1}{4}, +\infty)$

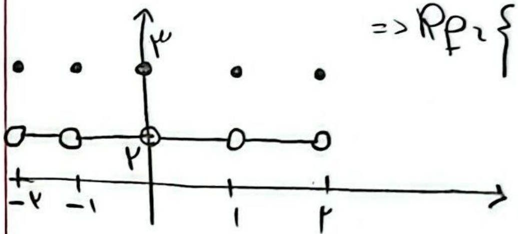


$2-x-2x-2 \to -3x$

$-3x \geq 1 \to x \geq -\frac{1}{3} \Rightarrow x \in [-\frac{1}{3}, +\infty)$

۹-

الف) $y = 3 + [x] + [-x]$



$\Rightarrow R_f = \{2, 3\}$

ب) (2)

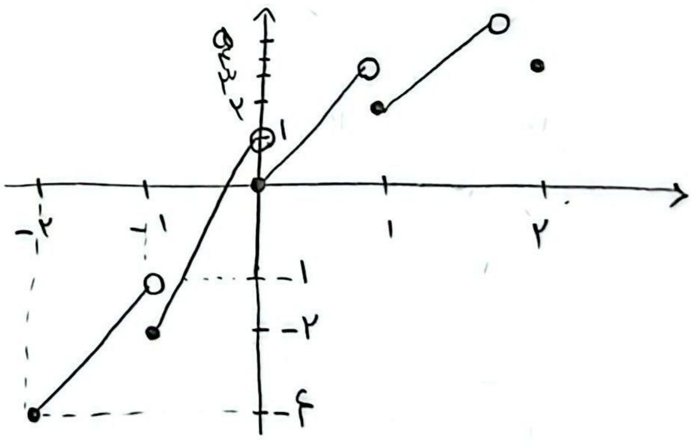
$-2 \leq x < -1 \to [x] = -2 \to 3x+2$

$-1 \leq x < 0 \to [x] = -1 \to 3x+1$

$0 \leq x < 1 \to [x] = 0 \to 3x$

$1 \leq x < 2 \to [x] = 1 \to 3x-1$

$x = 2 \to [x] = 2 \to 3x-2$



$R_f = [-4, 5)$

۱۰- (2)

الف) $f: x=1 \to 1$

$f: x=-1 \to 3$

$f: x=-\frac{b}{a} \to \frac{1}{2} \to x=\frac{1}{2} \to \frac{3}{4}$

$\Rightarrow R_f = [\frac{3}{4}, 3]$

ب) $f^2\ x=0 \to 1$

$f^2\ x=1 \to 3 \Rightarrow R_f = [1, 3]$

$f^2\ x=-\frac{1}{2} \to \times$