یازدهم ریاضی B — شماره کلاس ۷۰۱ — (۲۰) — ستوده مدارک

1

$f(x) = \sqrt{1-x^2}$ $g = \{(-1,1),(0,4),(2,0),(1,2)\}$ $2g-3f$ مجموع اعضای برد تابع

$D_f = \sqrt{(1-x)(1+x)}$ $D_f = [-1,1]$

در دامنه g فقط اعداد ۱- و ۰ و ۱ با دامنه f مشترک هستند

$3f(x) = \{(-1,0),(0,3),(1,0)\}$ $2g = \{(-1,2),(0,8),(2,0),(1,4)\}$

$2g-3f = \{(-1,2),(0,5),(1,4)\} \rightarrow 2+5+4 = 11$

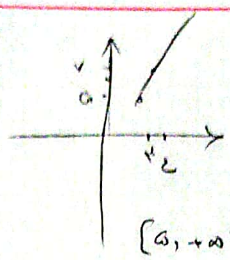
2

$f(x) = 2x-1$ $D_f = [3,+\infty)$

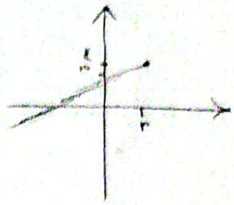
$g(x) = \frac{1}{2}x+3$ $D_g = (-\infty,2]$

$R_f \cup R_g = ?$

$(-\infty,4] \cup [5,+\infty)$



$[5,+\infty)$



$(-\infty,4]$

3

$y = \frac{-x^2}{2} + x + 2$ $R_y \xrightarrow{\text{برابر}} (a,b) \rightarrow (\frac{3}{2},+\infty)$ $-\frac{x^2}{2}+x+2 > \frac{3}{2} \rightarrow -x^2+2x+4>3$

$\max \sqrt{b-a}$ $\sqrt{3-(-1)} = 2$

$-(x^2-2x-3)>0$

$-(x-3)(x+1)>0$

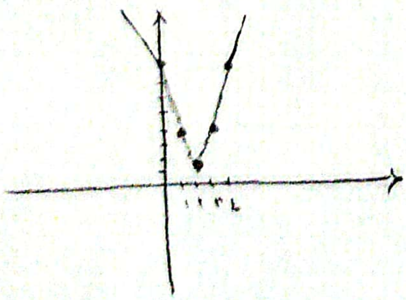
$(-1,3) \rightarrow \frac{3}{2}$

$a=-1$ $b=3$

4

$\min y = ?$ $y = |x-1|+|x-3|+|2x-4|$

$x<1$	$1<x<2$	$2<x<3$	$x>3$
$-x+1-x+3-2x+4$	$x-1-x+3-2x+4$	$x-1-x+3+2x-4$	$x-1+x-3+2x-4$
$-4x+8$	$-2x+6$	$2x-2$	$4x-8$



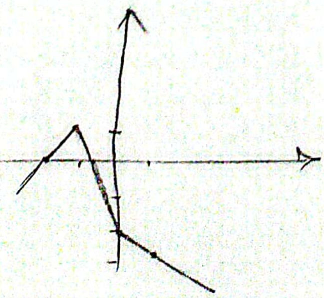
$\min y \rightarrow 2$

x	0	1	2	3	4
y	8	4	2	4	8

5

$R_y =$ رسم شکل $y = |x| - 2|x+1|$

$x<-1$	$-1<x<0$	$x>0$
$-x+2x+2$	$-x-2x-2$	$x-2x-2$
$x+2$	$-3x-2$	$-x-2$



$R_y = (-\infty,1]$

x	-2	-1	0	1
y	0	1	-2	-3

m عدد طبیعی $\rightarrow R_y \subset \mathbb{R}$ $\qquad y = \dfrac{x^2+5x+m}{x+1}$

$x^2+(5-y)x+m-y=0 \qquad x = \dfrac{y-5 \pm \sqrt{(5-y)^2-4m+4y}}{2} \Rightarrow y^2-10y+25-4m+4y \geq 0$

$y^2-6y+25-4m \geq 0$

$y^2-6y+25-4m \xrightarrow{\Delta \leq 0} 36-4(25-4m) \leq 0 \rightarrow 36-100+16m \leq 0 \Rightarrow 16m \leq 64$ (۲) 6

$m \leq 4$

$m<4 \Rightarrow \{1,2,3\}$ ... اگر به جای m عدد ۴ بگذاریم $\dfrac{x^2+5x+4}{x+1} = \dfrac{(x+1)(x+4)}{x+1}$ در این صورت ... $\mathbb{R}-\{3\}$ ... برای سه عدد طبیعی

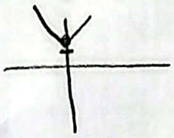
$R_f = ?$

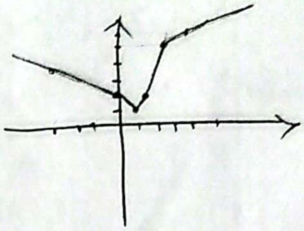
$f(x) = \begin{cases} x+2 & , x \geq 2 \\ x^2-2x+2 & , 0 \leq x < 2 \\ |x|+2 & , x<0 \end{cases}$

$R_1 = [5,+\infty)$ $\quad \begin{array}{c|cc} x & 2 & 4 \\ y & 5 & 6 \end{array}$

$y=(x-1)^2+1 \Rightarrow S\,|^{1}_{1}$

$R_{y_2} = [2,+\infty)$





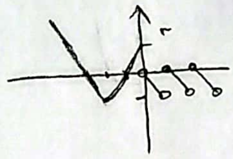
$R_f = [1,+\infty)$ (۲) 7

$\begin{array}{c|cc} x & 3 & 0 \\ y & 5 & 2 \end{array} \qquad \begin{array}{c|cc} x & 0 & -1 \\ y & 2 & 3 \end{array}$

$R_f = ?$

$f(x) = \begin{cases} x^2+4x+3 & x \leq 0 \\ [2x]-2x & x>0 \end{cases}$

$\rightarrow S\,|^{-2}_{-1}$



$R_1 = [-1,+\infty)$ (۳) 8

$\Rightarrow R_2 = (-1,0]$ $\qquad R_1 \cup R_2 = [-1,+\infty)$

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

$D_y = [b,+\infty)$

$R_y = (-\infty,5]$

$ab = ?$

$D_f = 2x+3 \geq 0 \rightarrow x \geq -\frac{3}{2} \rightarrow b = -\frac{3}{2}$

$R_f \rightarrow y_{max} \xrightarrow{\text{وقتی}} \sqrt{2x+3} \Rightarrow \min \Rightarrow \sqrt{2x+3} \rightarrow 0 \quad y=5$ 9

$x = -\frac{3}{2}$

$y = a+1 \rightarrow 5$

$a = 4$ (۳)

$\left(-\frac{3}{2}\right) \times 4 = -6$

$f(x) = 2\sqrt{x+1}+4\sqrt{1-x}$ $\qquad x+1 \geq 0 \rightarrow x \geq -1$, $\quad 1-x \geq 0 \rightarrow x \leq 1$ $\qquad x \in [-1,1]$ $\qquad R_g = [0,+\sqrt{2}]$

$f(x)+g(x) = 3\sqrt{2+2\sqrt{1-x^2}}$ $\qquad f(1) = 2\sqrt{2},\ f(-1) = 4\sqrt{2} \qquad f(0)=6$ (۲) 10

$D_f = D_g$ $\qquad f(1)+g(1) = 3\sqrt{2+2\sqrt{1-(1)^2}} = g(1) = 3\sqrt{2}-2\sqrt{2} = \sqrt{2}$

$f(-1)+g(-1) = 3\sqrt{2+2\sqrt{1-(-1)^2}} = g(-1) = 3\sqrt{2}-4\sqrt{2} = -\sqrt{2}$

$R_y = ?$ $\quad y = \dfrac{f(x)}{6} - \dfrac{g(x)}{2}$ $\qquad y(1) = \dfrac{2\sqrt{2}}{6} - \dfrac{\sqrt{2}}{2} = 0 \qquad y(-1) = \dfrac{4\sqrt{2}}{6} - \dfrac{-\sqrt{2}}{2} = \dfrac{9\sqrt{2}}{6} = \sqrt{2}$