ماهانه حسابان - یازدهم پسر A - تکلیف هشت

۱- $f(x)=\sqrt{1-x^2}\ ,\ g=\{(-1,1),(0,4),(2,0),(1,2)\}$

$2g-3f=?$

$1-x^2\geq 0 \rightarrow x^2\leq 1 \rightarrow -1\leq x\leq 1 \Rightarrow D_f=[-1,1]$

$D_g=\{-1,0,2,1\}$

اعضای مشترک دامنه‌ها ← $-1,0,1$

$f(1)=0\ ,\ g(1)=2 \rightarrow 4-3(0)=4$

$f(0)=1\ ,\ g(0)=4 \rightarrow 8-3=5$

$f(-1)=0\ ,\ g(-1)=1 \rightarrow 2-3(0)=2$

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

۲- $f(x)=2x-1 \rightarrow [3,+\infty) \rightarrow (2\times3)-1=5\ ,\ (2\times4)-1=7\ ,\dots \rightarrow R_f=[5,+\infty)$

$g(x)=\frac{1}{3}x+3 \rightarrow (-\infty,3] \rightarrow \frac{1}{3}(3)+3=4\ ,\ \frac{1}{3}(2)+3=\frac{11}{3}\ ,\dots \rightarrow R_g=(-\infty,4]$

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

۳- $y=\frac{-x^2}{2}+x+3 \rightarrow \frac{-x^2}{2}+x+3>\frac{3}{2} \rightarrow \frac{-x^2}{2}+x+\frac{3}{2}>0 \rightarrow -x^2+2x+3>0$

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

	-1		3	
$-$		$+$		$-$

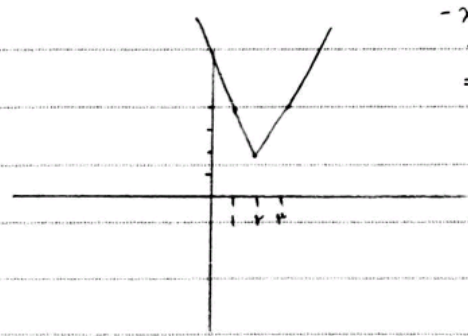
$(-1,3)$

$(-1,3)=(a,b) \rightarrow a=-1\ ,\ b=3$

$\sqrt{b-a}=\sqrt{3+1}=\sqrt{4}=2$

۴- $y=|x-1|+|x-3|+|2x-4|$

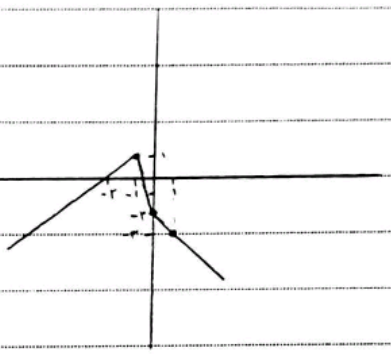
	1	2	3
$-x+1-x+3$ $-2x+4$ $=-4x+8$	$x-1-x+3$ $-2x+4$ $=-2x+6$	$x-1-x+3$ $+2x-4$ $=2x-2$	$x-1+x-3+2x-4$ $=4x-8$
	4	2	4



$\rightarrow 2$

۵- $y = |x| - 2|x+1|$

$x < -1$	$-1 \le x < 0$	$x \ge 0$
$-x + 2x + 2 = x + 2$	$-x - 2x - 2 = -3x - 2$	$x - 2x - 2 = -(x+2)$



$Ry = (-\infty, 1]$

۶- $y = \frac{x^2 + 5x + m}{x+1} \rightarrow xy + y = x^2 + 5x + m \rightarrow x^2 + (5-y)x + m - y = 0$

$\Delta = \frac{y - 5 \pm y^2 - 10y + 25 + 4y - 4m}{2}$

$\Delta \le 0$

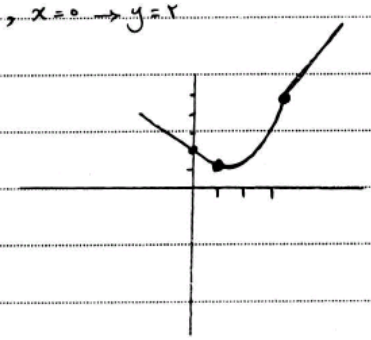
$24 - 100 + 16m \le 0 \Rightarrow 16m - 76 \le 0$

$m \le 4 \rightarrow m = \{1, 2, 3, 4\}$ ← تعداد حالت‌ها

۷- $x+2 \rightarrow x \ge 2 \xrightarrow{x=2} y = 5$

$x^2 - 2x + 2 \rightarrow 0 \le x \le 2 \rightarrow x = 2 \rightarrow y = 5 \;,\; x = 0 \rightarrow y = 2$

$|x| + 2 \rightarrow x < 0 \rightarrow x = 0 \rightarrow y = 2$



$Rf = [1, +\infty)$

۸- $x^2 + 4x + 3 \rightarrow x \le 0$

$[2x] - 2x \rightarrow x > 0 \rightarrow 2x = t \rightarrow [t] - t \rightarrow (-1, 0]$ I

$y' = x^2 + 4x + 3 \rightarrow \frac{-b}{2a} = \frac{-4}{2} = -2$

$4 - 8 + 3 = -1$

$\rightarrow Ry' = [-1, +\infty)$ II

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Subject:

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$y = a+1 - \sqrt{rx+r}$ $\quad Dy = [b, +\infty)$ $\quad Ry = (-\infty, a]$ ۹

$rx+r \geq 0 \rightarrow x \geq \frac{-r}{r} \Rightarrow Dy = [\frac{-r}{r}, +\infty) \Rightarrow b = \frac{-r}{r}$

$-\infty < a+1 - \sqrt{rx+r} \leq a+1$ $\quad a \times b = \frac{-r}{r} \times \varepsilon = -\varphi$

$a+1 = a$, $a = \varepsilon$

$f(x) = r\sqrt{x+1} + r\sqrt{1-x}$ $\quad Df = Dg$ $\quad \frac{f(x)}{\varphi} - \frac{g(x)}{r}$ ۱۰

$f(x) + g(x) = r\sqrt{r+r\sqrt{1-x^r}}$

$x+1 \geq 0 \rightarrow x \geq -1$, $1-x \geq 0 \rightarrow x \leq 1 \Rightarrow Df = [-1, 1]$

$r\sqrt{r+r\sqrt{1-x^r}} - f(x) = g(x) = r\sqrt{r+r\sqrt{1-x^r}} - r\sqrt{x+1} + r\sqrt{1-x}$

$\frac{r\sqrt{x+1} + r\sqrt{1-x}}{\varphi} - \frac{r\sqrt{r+r\sqrt{1-x^r}} - r\sqrt{x+1} - r\sqrt{1-x}}{r} = \sqrt{x+1} + r\sqrt{1-x} - \sqrt{(\sqrt{1-x} + \sqrt{1+x})^r}$

$= \sqrt{x+1} + r\sqrt{1-x} - |\sqrt{1-x} + \sqrt{1+x}|$

$\sqrt{x+1} + r\sqrt{1-x} - \sqrt{1-x} - \sqrt{x+1} = \sqrt{1-x}$

$Df = [-1, 1]$ $\Big\}$ $Ry = [0, \sqrt{r}]$