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بیلان ریاضی — یازدهم دخترانه B — کلید شماره ۸

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

$f(x)=\{(-1,0)(0,1)\cancel{(2,\sqrt{-3})}(1,0)\}$

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

۲- $f(x)=2x-1 \quad D_f=[3,+\infty) \xrightarrow{x=3} y=5 \quad R=[5,+\infty)$

$g(x)=\frac{1}{2}x+3 \quad D_g=(-\infty,2] \xrightarrow{x=2} y=4 \quad R=(-\infty,4]$

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

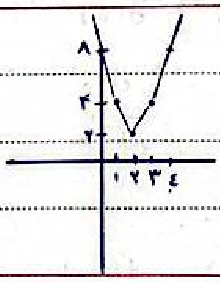
۳- $y=\frac{-x^2}{2}+x+3>\frac{3}{2} \xrightarrow{\times 2} -x^2+2x+6>3 \Rightarrow -x^2+2x+3>0 \Rightarrow x^2-2x-3<0$

$\Rightarrow (x-3)(x+1)<0 \quad \begin{array}{ccccc} & -1 & & 3 & \\ + & 0 & - & 0 & + \end{array} \Rightarrow (a,b)=(-1,3)$

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

۴- $y=|x-1|+|x-3|+|2x-4|$ $\quad x=4 \to 8$ $\quad x=0 \to 8$

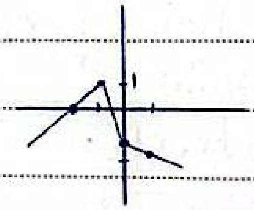
	1		2		3	
$-4x+8$	(4)	$-2x+6$	(2)	$2x-2$	(4)	$4x-8$



$y_{min}=\boxed{2}$

۵- $y=|x|-2|x+1|$ $\quad x=1 \to -3$ $\quad x=-2 \to 0$

	-1		0	
$x+2$	(1)	$-3x-2$	(-2)	$-x-2$



$\Rightarrow R=(-\infty,1]$

۶- $y=\frac{x^2+5x+m}{x+1} \Rightarrow \frac{(x+1)(x+4)+(m-4)}{x+1} \xrightarrow{R=\mathbb{R}}$ if $m=4 \to y=(x+4) \Rightarrow R=\mathbb{R}-\{3\}$
(-1 ← $x+4$ ریشه فرع)

$\Rightarrow m\neq 4$ ①

$x^2+5x+m=yx+y \Rightarrow x^2+(5-y)x+(m-y)=0 \Rightarrow \Delta=(5-y)^2-4(m-y)\geq 0$

$y^2-10y+25-4m+4y\geq 0 \Rightarrow (y-3)^2-4(m-4)\geq 0 \xrightarrow{y=3} -4m+16\geq 0 \Rightarrow m\leq 4$ ②

②,① $\to m=\{1,2,3\}$

Subject:
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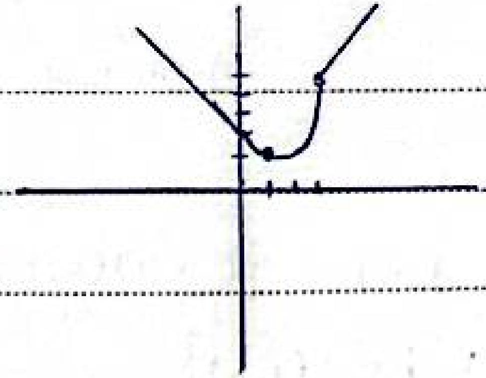
$$\begin{cases} x+2 & ; x \geq 3 \\ x^2-2x+2 & ; 0 \leq x < 3 \\ |x|+2 & ; x < 0 \end{cases} \longrightarrow \min \left| \begin{array}{l} \frac{-b}{2a} = 1 \\ 1 \end{array} \right.$$



$R_f = [1, +\infty)$

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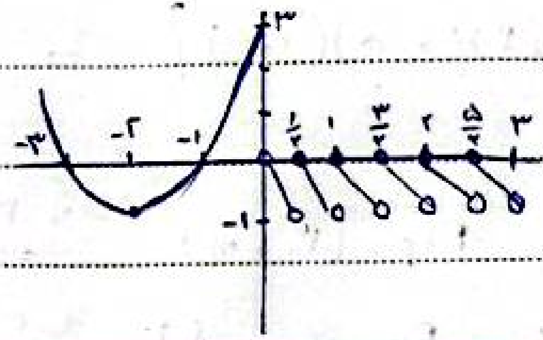
$$\begin{cases} x^2+4x+3 & ; x \leq 0 \\ [2x]-2x & ; x \geq 0 \end{cases} \longrightarrow \min \left| \begin{array}{l} \frac{-b}{2a} = -2 \\ 4-8+3 = -1 \end{array} \right.$$



$R_f = [-1, +\infty)$

۹-

$y = a+1 - \sqrt{2x+3}$ $\quad D_f = [b, +\infty)$ $\quad R_f = (-\infty, 5]$

$D = [b, +\infty) \longrightarrow 2x+3 \geq 0 \Rightarrow x \geq \frac{-3}{2} \longrightarrow b = \frac{-3}{2}$

$-\sqrt{2x+3} \leq 0 \xrightarrow{+(a+1)} y \leq a+1 \Rightarrow a+1 = 5 \longrightarrow a = 4 \quad \Rightarrow ab = \frac{-3}{2} \times 4 = \boxed{-6}$

حل- $f(x) = ۲\sqrt{x+1} + ۴\sqrt{1-x}$

$g(x) = ۳\sqrt{۲+۲\sqrt{1-x^۲}} - f(x)$

$y = \frac{f(x)}{۶} - \frac{g(x)}{۳} = \frac{f(x)}{۶} - \frac{1}{۳}\left(۳\sqrt{۲+۲\sqrt{1-x^۲}} - f(x)\right) = \frac{f(x)}{۲} - \sqrt{۲+۲\sqrt{1-x^۲}}$

دامنه $= [-1,1]$

$\Rightarrow \sqrt{x+1} + ۲\sqrt{1-x} - \sqrt{۲+۲\sqrt{1-x^۲}} = \sqrt{x+1} + ۲\sqrt{1-x} - \sqrt{\left(\sqrt{1+x} + \sqrt{1-x}\right)^۲}$

$= \sqrt{x+1} + ۲\sqrt{1-x} - \sqrt{1+x} - \sqrt{1-x} = \sqrt{1-x}$

$R_f = [0, \sqrt{۲}]$