کیانا دیباج   یازدهم تک سلنبه A   تکلیف ۸

۱)

$f(x)=\sqrt{1-x^2}=$

$g=\{(-1,1)(0,4)(2,0)(1,2)\}$

$2g-3f=$

$2g=\{(-1,2)(0,0)(2,4)(1,2)\}$

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

$\Rightarrow -2+(-3)+2=\boxed{-3}$

۲)

$f(x)=2x-1 \xrightarrow{D_f} [3,\infty) \Rightarrow 2\times(3)-1=5 \Rightarrow R_f=[5,+\infty)$

$g(x)=\frac{1}{3}x+3 \xrightarrow{D_g} (-\infty,3] \Rightarrow \frac{1}{3}(3)+3=4 \Rightarrow R_g=(-\infty,4]$

$\xrightarrow{\cup} \boxed{(-\infty,4]\cup[5,+\infty)}$

۳)

$y=\frac{-x^2}{2}+x+3 \rightarrow$ مقدار max

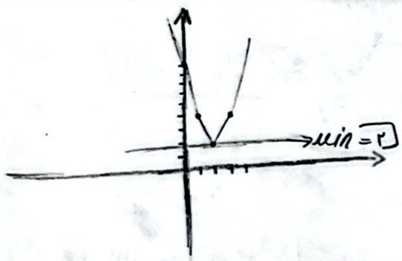
max: $\frac{-b}{2a}=\frac{-1}{2\times(-\frac{1}{2})}=1$, $3/5$

$y_x>\frac{3}{2} \Rightarrow \left(\frac{-x^2}{2}+x+3>\frac{3}{2}\right)\times 2 \Rightarrow -x^2+2x+6>3 \Rightarrow -x^2+2x+3>0$

$\Rightarrow x^2-2x-3<0 \xrightarrow{\text{ریشه‌ها}} x=\frac{2\pm\sqrt{(-2)^2-4(1\times-3)}}{2(1)}=\frac{2\pm\sqrt{4+12}}{2}=\frac{2\pm4}{2} \Rightarrow \begin{cases} x_1=-1 \\ x_2=3 \end{cases}$

$\Rightarrow -1<x<3 \Rightarrow (a,b)=(-1,3) \Rightarrow \sqrt{3+1}=\boxed{2}$

۴)



$\rightarrow min=\boxed{2}$

$y=|x-1|+|x-3|+|2x-4|$

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

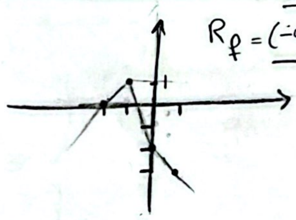
$\begin{bmatrix}0\\8\end{bmatrix}$ $\begin{bmatrix}1\\4\end{bmatrix}$ $\begin{bmatrix}2\\2\end{bmatrix}$ $\begin{bmatrix}3\\4\end{bmatrix}$

۵)

$y=|x|-2|x+1|$

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

$\begin{bmatrix}-2\\0\end{bmatrix}$ $\begin{bmatrix}-1\\1\end{bmatrix}$ $\begin{bmatrix}0\\-2\end{bmatrix}$ $\begin{bmatrix}1\\-3\end{bmatrix}$



$R_f=\boxed{(-\infty,1]}$

۶)

$y=\frac{x^2+5x+m}{x+1} \Rightarrow$

$$\begin{array}{l|l} x^2+5x+m & x+1 \\ \hline \cancel{-x^2}-x & x+4 \\ \hline \cancel{4x}+m & \\ \cancel{-4x}-4 & \\ \hline m-4 & \end{array}$$

$\Rightarrow \left(y=x+4+\frac{m-4}{x+1}\right)\times(x+1)$

$\Rightarrow y(x+1)=(x+4)(x+1)+(m-4)$

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

$\Delta=(5-y)^2-4(m-y) \Rightarrow \Delta=y^2-6y+(25-4m)$

$\Rightarrow \Delta<0 \Rightarrow (-6)^2-4(25-4m)<0 \Rightarrow m<4 \Rightarrow 1,2,3$

۳ عدد

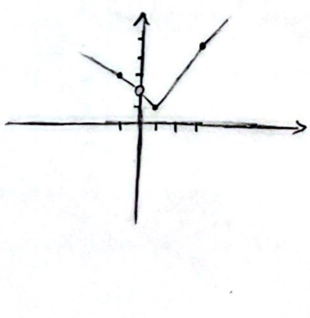
۷)

$f(x)=\begin{cases} x+2 & ; x\geq 3 \\ x^2-2x+2 & ; 0\leq x<3 \\ |x|+2 & ; x<0 \end{cases}$

	0	3
$-x+2$	x^2-2x+2	$x+2$

$\begin{bmatrix}-1\\3\end{bmatrix}$ $\begin{bmatrix}0\\2\end{bmatrix}$ $\begin{bmatrix}1\\1\end{bmatrix}$ $\begin{bmatrix}3\\5\end{bmatrix}$

$R_f=[1,+\infty)$



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$$f(x)=\begin{cases} x^2+4x+3 \;;\; x\le 0 & \longrightarrow \min \left| \begin{array}{l} \frac{-b}{2a}=-\frac{4}{2}=-2 \\ -1 \end{array} \right. \Rightarrow [-1,+\infty) \\ [2x]-2x \;;\; x>0 \end{cases}$$

$$k\le 2x<k+1 \Rightarrow \begin{cases} 2x=k \Rightarrow k-k=0 \\ k-(k+1)=-1 \Rightarrow (-1,0] \end{cases} \Longrightarrow \boxed{R_f=[-1,+\infty)}$$

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$$y=a+1-\sqrt{2x+3} \Rightarrow 2x+3\ge 0 \Rightarrow x\ge -\frac{3}{2} \Rightarrow [-\frac{3}{2},+\infty) \Rightarrow b=-\frac{3}{2}$$

$D_f=[b,+\infty)$ $\qquad a+1-\underbrace{\sqrt{2x-\frac{3}{2}+3}}_{0} \Rightarrow a+1=5 \Rightarrow a=4$

$R_f=(-\infty,5]$ $\qquad \cancel{4}^{2}\times\frac{-3}{\cancel{2}}=\boxed{-6}$

$ab=?$

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$$f(x)=2\sqrt{x+1}+4\sqrt{1-x} \Rightarrow \begin{cases} x+1\ge 0 \Rightarrow x\ge -1 \\ 1-x\ge 0 \Rightarrow 1\ge x \end{cases} \Rightarrow [-1,1]=D_f=D_g$$

$$\frac{f(x)}{6}-\frac{g(x)}{3}=\frac{2\sqrt{x+1}+4\sqrt{1-x}+2\sqrt{1+x}-2\sqrt{1-x}}{6}=\frac{4\sqrt{1+x}+2\sqrt{1-x}}{6}$$

$$=\frac{2(\sqrt{1-x}+2\sqrt{1+x})}{6}=\frac{2\sqrt{1+x}+\sqrt{1+x}}{3} \Rightarrow D_f=[-1,1]$$

$$\left.\begin{array}{l} \text{if } x=-1 \Rightarrow \frac{2\sqrt{1-1}+\sqrt{1+1}}{3}=\frac{\sqrt{2}}{3} \\ \text{if } x=1 \Rightarrow \frac{2\sqrt{1+1}+\sqrt{1-1}}{3}=\frac{2\sqrt{2}}{3} \end{array}\right\} \Rightarrow \boxed{R_f=[\frac{\sqrt{2}}{3},\frac{2\sqrt{2}}{3}]}$$