کیان جعفری

① $2g=\{(-1,2),(0,8),(2,0),(1,4)\}$

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

$\Rightarrow 2+8+4=14$

② $R_f=[5,+\infty)$ $R_g=(-\infty,4] \Rightarrow R_f \cup R_g = (-\infty,4] \cup [5,+\infty)$

③ $\frac{-x^2}{2}+x+3>\frac{3}{2} \Rightarrow -x^2+2x+6>3$

$\Rightarrow x^2-2x-3<0 \Rightarrow$

x		-1		3	
	+	0	−	0	+

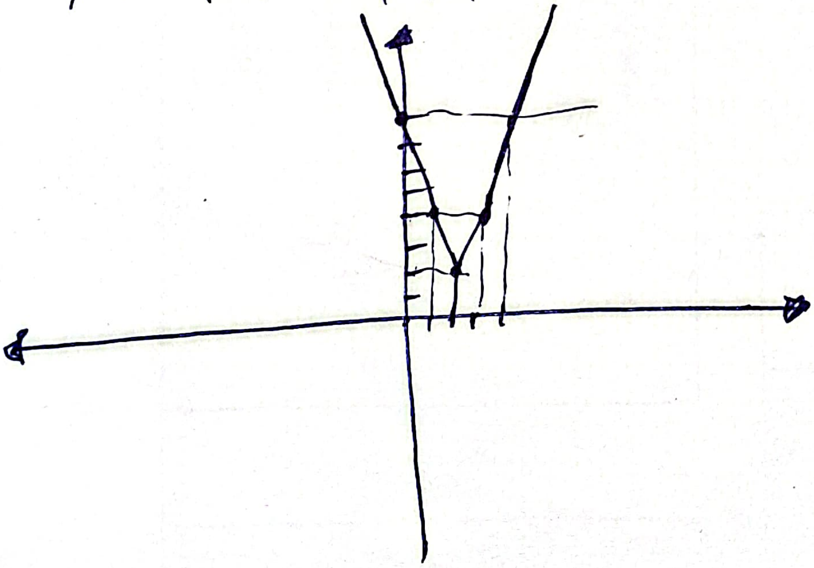
$\Rightarrow a=-1$, $b=3$

$\Rightarrow \sqrt{3+1}=2$

④ $Y=|x-1|+|x-3|+|2x-4|$

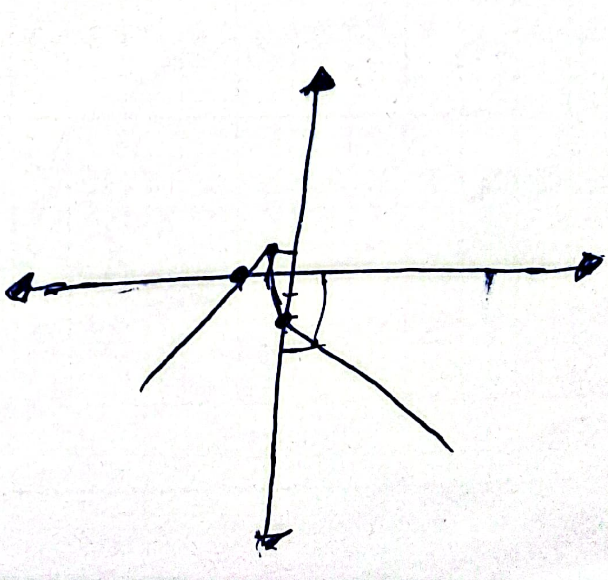
x	0	1	2	3	4
Y	8	4	2	4	8

کمترین مقدار = $\boxed{2}$



⑤ $Y=|x|-2|x+1|$

x	-2	-1	0	1
Y	0	1	-2	-3



$R_y=[1,-\infty)$

⑥ $6x+6=x^2+ax+m \Rightarrow x^2+(a-6)x+m-6=0$

$\Delta \geq 0 \Rightarrow (a-6)^2-4(m-6)\geq 0 \Rightarrow a^2-12a+60-4m \geq 0$

$\Rightarrow a>0 ,\ \Delta \leq 0 \Rightarrow \cancel{144}-\cancel{4}(60-4m)\leq 0 \Rightarrow 9-(15-4m)\leq$

$9-15+4m \leq 0 \Rightarrow$

$4m \leq 14 \Rightarrow m \leq 4 \Rightarrow m \in \{1,2,3,4\}$

⑦ $x+2 \xrightarrow{3} [5,+\infty)$

$x^2-2x+3 \quad \frac{-b}{2a} \quad \frac{2}{2}=1 \xrightarrow{1} 1-2+3=2 \Rightarrow [2,6]$

$\xrightarrow{3} 9-6+3=6$

$|x|+2 \xrightarrow{0} [2,+\infty)$

$\Rightarrow R_f=[2,+\infty)$

⑧ $x^2+4x+3 \Rightarrow \frac{-4}{2}=-2 \xrightarrow{-2} 4-8+3=-1$

$\Rightarrow [-1,+\infty)$

$[2x]-\cancel{[2x]} \Rightarrow [0,1] \Rightarrow R_f=[-1,+\infty)$

⑨ $2x+3 \geq 0 \Rightarrow 2x \geq -3 \Rightarrow x \geq \frac{-3}{2} \Rightarrow \boxed{b=\frac{-3}{2}}$

$0+1+a=5 \Rightarrow \boxed{a=4} \quad ab=\frac{-3}{2}\cdot 4=-6$

⑩ $f(x)+g(x)=\sqrt{18+18\sqrt{1-x^2}}=3\sqrt{1+x}+3\sqrt{1-x}$

$\Rightarrow g(x)=\sqrt{x+1}-\sqrt{1-x}$

$$\frac{\cancel{4}(\sqrt{x+1}+2\sqrt{1-x})}{4\cdot 3}-\frac{\sqrt{1+x}-\sqrt{1-x}}{3}=\frac{\cancel{3}\sqrt{1-x}}{\cancel{3}}$$

$D_y=(-\infty,1] ,\ R_y=[0,+\infty)$