تکلیف شماره ۵ — معین نصری — یازدهم بیر B

۱۹,۷۵ عالی نوشتی

۱,۷۵

①

$f(x)=\sqrt{1-x^2} \longrightarrow D_f=[-1,1]$

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

$2g-3f=\{(-1,2),(0,5),(1,4)\}$ ✓ $\xrightarrow{\text{جمع}} \boxed{11}$ دقت!

② ۲

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

$\left.\begin{matrix} \min f=5 \\ \max f=+\infty \end{matrix}\right\} \to R_f=[5,+\infty) \quad \mathrm{I}$

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

$\left.\begin{matrix} \max g=4 \\ \min g=-\infty \end{matrix}\right\} \to R=(-\infty,4] \quad \mathrm{II}$

$\Longrightarrow R_f\cup R_g=\mathrm{I}\cup\mathrm{II}=(-\infty,4]\cup[5,+\infty)$ ✓

③ ۲

$y=\frac{-x^2}{2}+x+3 \longrightarrow \frac{-x^2}{2}+x+3>\frac{3}{2} \xrightarrow{\times 2} -x^2+2x+3>0 \xrightarrow{\times \ominus} x^2-2x-3<0$

$\longrightarrow (x-3)(x+1)<0 \longrightarrow -1<x<3 \longrightarrow (a,b)=(-1,3)$

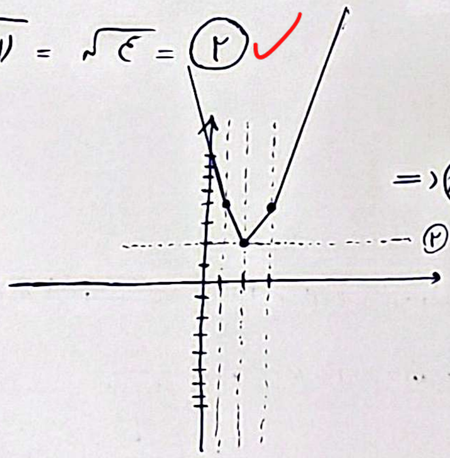
$\begin{array}{ccccc} & -1 & & 3 & \\ + & \circ & - & \circ & + \end{array}$

$\Rightarrow \sqrt{b-a}=\sqrt{3-(-1)}=\sqrt{4}=2$ ✓

④ ۲

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

$\begin{array}{ccccccc} & ① & & ② & & ③ & \\ -4x+8 & ④ & -2x+6 & ② & 2x-2 & ④ & 4x-8 \end{array}$

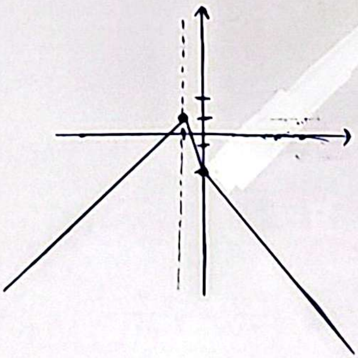


$\Rightarrow \min R_f=2$ ✓

⑤ ۲

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

$\begin{array}{ccccc} & -1 & & 0 & \\ x+2 & ① & -3x-2 & -2 & -x-2 \end{array}$



$\Rightarrow R_f=(-\infty,1]$ ✓

یازدهم تیر B   معین نصری   تکلیف شماره ۵

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$$y=\frac{x^2+5x+m}{x+1} \longrightarrow yx+y=x^2+5x+m \Rightarrow x^2+(5-y)x+(m-y)$$

$$\Rightarrow \Delta \geq 0 \Rightarrow (5-y)^2-4(m-y)\geq 0 \Rightarrow y^2-6y+(25-4m) \xrightarrow{\frac{-b}{2a}=3} 3^2-18+25-4m=16-4m\geq 0$$

$$\Rightarrow m\leq 4 \xrightarrow{m\neq 4} m=\{1,2,3\}$$

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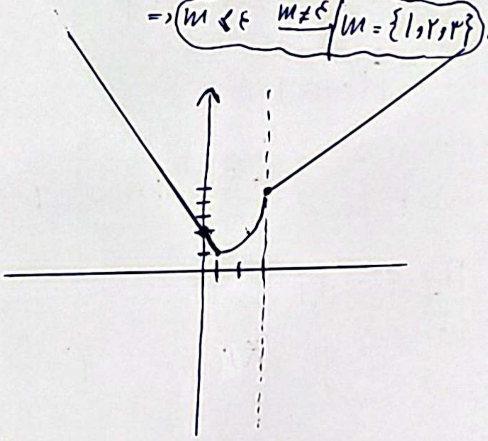
$$f(x)=\begin{cases} x+2 & : x\geq 3 \\ x^2-2x+2 & : 0\leq x<3 \\ |x|+2 & : x<0 \end{cases}$$



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

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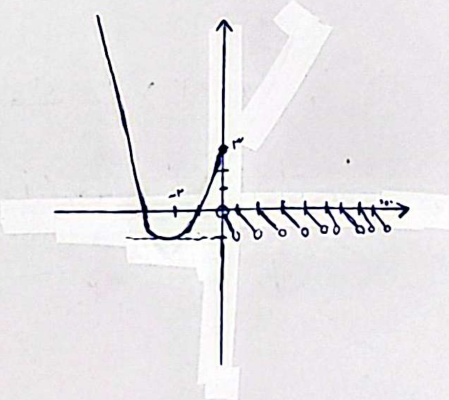
$$(x+3)(x+1)$$

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

$$\frac{-b}{2a}=\frac{-4}{2}=-2 \qquad 4-8+3=-1$$



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

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

$$D_f=[b,+\infty) \longrightarrow -\sqrt{2x+3}+a+1 \longrightarrow 2x+3\geq 3 \rightarrow x\geq -\frac{3}{2} \longrightarrow b=-\frac{3}{2}$$

$$R_f=(-\infty,5] \longrightarrow 5=\max R_f \;,\; \min\sqrt{2x+3} = 0 \longrightarrow 5=a+1 \longrightarrow a=4$$

$$\Rightarrow ab=4\times -\frac{3}{2}=-6$$

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$$f(x)+g(x)=3\sqrt{\left((\sqrt{x+1})+(\sqrt{1-x})\right)^{\cancel{2}}} \Rightarrow f(x)+g(x)=3(\sqrt{x+1}+\sqrt{1-x})$$

$$\Rightarrow \underbrace{(f(x)+g(x))-f(x)}_{\text{چون دامنه‌ها برابر است}}=3\sqrt{x+1}+3\sqrt{1-x}-2\sqrt{x+1}-4\sqrt{1-x}=\sqrt{x+1}-\sqrt{1-x}=g(x)$$

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

$$\Rightarrow \sqrt{1-x} \xrightarrow[\text{دامنه}]{[-1,1]} R_{h(x)}=[0,\sqrt{2}]$$

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