سانیا جابری

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۱,۲۵ ①

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

$R_f = \{0, 1\}$

$R_g = \{1, 2, 4\}$

$D_g = \{-1, 0, 2, 1\}$ ②

① ∩ ② = $\{-1, 0, 1\}$

$2+4+5=11$

$2g-3f = \left.\begin{matrix} 2\times 2 - 3\times 0 = 2 \\ 2\times 4 - 3\times 1 = 5 \\ 2\times 1 - 3\times 0 = 2 \end{matrix}\right\} \Rightarrow 4$

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

۲ ②

$f(x) = 2x - 1 \longrightarrow D_f = [3, +\infty) \longrightarrow f(3) = 6-1 = 5$

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

$\left.\begin{matrix} R_f = [5, +\infty) \\ R_g = (-\infty, 4] \end{matrix}\right\} \cup \Rightarrow R - (4, 5)$

۳ ③

$y = \frac{-x^2}{2} + x + 3 \longrightarrow \left(\frac{3}{2} = -\frac{x^2}{2} + x + 3\right) \xrightarrow{\times 2} 3 = -x^2 + 2x + 6 \longrightarrow x^2 - 2x - 3 = 0$

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

$\boxed{x=3}$ $\boxed{x=-1} \longrightarrow (-1, 3)$

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

۳ ④

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

$x = 1 \longrightarrow y = 4$

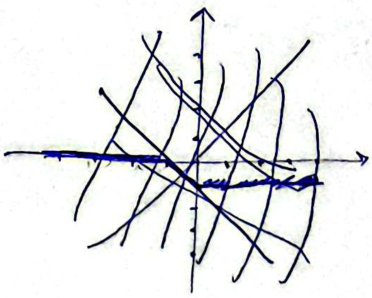
$\boxed{x = 2} \longrightarrow y = 2 \longrightarrow$ کمترین مقدار

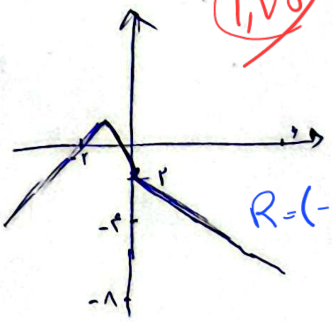
$x = 3 \longrightarrow y = 4$

۱,۷۵ ⑤

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

$$\begin{cases} x+2 & x < -1 \\ -3x-2 & -1 \leq x \leq 0 \\ -x-2 & x \geq 0 \end{cases}$$





$R = (-\infty, 1]$

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$y = \frac{x^2 + 5x + m}{x+1} \Rightarrow x^2 + (5-6)x + (m-6) = 0$

$\Delta = 6^2 - 46 + (25 - 4m) \geq 0 \longrightarrow \Delta = (-6)^2 - 4(1)(25-4m) = 36 - 100 + 16m = 16m - 64$

$\Delta \leq 0 \longrightarrow 16m - 64 \leq 0 \longrightarrow m \leq 4$

$m = 4 \longrightarrow y = \frac{x^2 + 5x + 4}{x+1} = \frac{(x+1)(x+4)}{x+1} \longrightarrow x \neq -1 \Rightarrow y = x + 4$

$x = -1 \Rightarrow y = -1 + 4 = 3 \longrightarrow m = 4 \rightarrow \underbrace{R - \{3\}}_{\times} \longrightarrow m < 4 \rightarrow \{1, 2, 3\} = 3$ عدد

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

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1) $f(x)=|x|+2=-x+2$ برای $x<0$ داریم $|x|>0$

$f(x)>0$

$R=(2,+\infty)\cup$

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2) $0\leq x<3 \to f(x)=x^2-2x+2=(x-1)^2$

$x=1\to y=1$

$x=0\to y=2 \implies [1,5)\ \cup$ $\Rightarrow \boxed{[1,+\infty)}$

$x=3\to 5=9-6+2$

3) $f(x)=x+2 \qquad x\geq 3$

$x=3\to f(x)=5 \longrightarrow R=[5,+\infty)\ \cup$

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

$f\leq 0 \longrightarrow f(x)=x^2+4x+3=(x+2)^2-1$

$f(-2)=x^2+4x+3 \Rightarrow (-2)^2+4\times -2+3=4-8+3=-1 \longrightarrow \min$

$x=0\longrightarrow f(0)=3 \longrightarrow R=[-1,+\infty)$

$f(x)=[2x]-2x$

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$x>0 \longrightarrow n=[2x] \longrightarrow n\leq 2x<n+1$

$f(x)=n-2x \in (-1,0] \longrightarrow (-1,0]$

$[-1,+\infty)\cup(-1,0) \Rightarrow [-1,+\infty)$

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

$b=x=-\frac{3}{2} \implies 5=a+1 \longrightarrow \boxed{a=4} \longrightarrow -\frac{3}{2}\times 4=-6$

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$f(x)=2\sqrt{x+1}+4\sqrt{1-x} \longrightarrow x=-1,\ x=1$

x		-1		1	
	$-$		$+$		$-$

$D_f=[-1,1]$

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

$g(x)=3\sqrt{2+2\sqrt{1-x^2}}-f(x)$ $-1\leq x\leq 1 \longrightarrow D_f=D_g$

$y=\frac{f(x)}{6}-\frac{g(x)}{3} \Rightarrow \frac{f(x)}{6}-\frac{1}{3}\times\left(3\sqrt{2+2\sqrt{1-x^2}}-f(x)\right) \Rightarrow$

$\frac{f(x)}{6}-\sqrt{2+2\sqrt{1-x^2}}+\frac{2\times f(x)}{2\times 3} \longrightarrow \frac{3f(x)}{6}-\sqrt{2+2\sqrt{1-x^2}} \Rightarrow \sqrt{1+x}+2\sqrt{1-x}-\sqrt{2+2\sqrt{1-x^2}}$

$1 \Rightarrow \sqrt{2}-\sqrt{2}=0 \qquad -1 \longrightarrow 2\sqrt{2}-\sqrt{2}=\sqrt{2}$

$R=[0,\sqrt{2}]$