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۲۰ — دریا دیانی دردستی

(1)

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

$1 - x^2 \geq 0 \rightarrow (1-x)(1+x) \geq 0$

$\begin{array}{c} -1 \quad 1 \\ - \;|\; + \; + \;|\; - \end{array}$

D مشترک $= \{-1, 0, 1\}$ ۳

$2g(-1) - 3f(-1) = 2 - 0 = 2$ $\qquad 2 + 5 + 4 = 11$

$2g(0) - 3f(0) = 8 - 3 = 5$

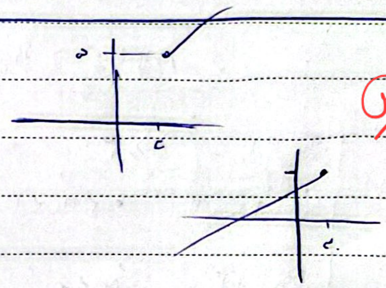
$2g(1) - 3f(1) = 4 - 0 = 4$

(2) ۳

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

$g(x) = \frac{1}{2}x + 3 \rightarrow D_g = (-\infty, 2] \rightarrow R_g = (-\infty, 4]$

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



(3) ۳

$y = -\frac{1}{2}x^2 + x + 3 \qquad f_y \rightarrow (a, b) \rightarrow (\frac{3}{2}, +\infty)$

$(-\frac{1}{2}x^2 + x + 3 > \frac{3}{2}) \times 2 \rightarrow -x^2 + 2x + 6 > 3 \rightarrow x^2 - 2x - 3 < 0$

$(x-3)(x+1) < 0$ $\qquad \begin{array}{c} -1 \quad 3 \\ + \;|\; - \;|\; + \end{array}$

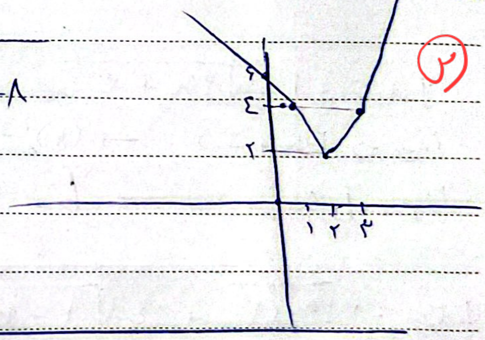
$\sqrt{b-a} = \sqrt{4} = 2$ $\qquad D_f = (\underset{a}{-1}, \underset{b}{3})$

(4) ۳

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

$x < 1$	1 to 2	2 to 3	$x > 3$
$-4x + 9$	$-2x + 9$	$2x - 2$	$4x - 8$

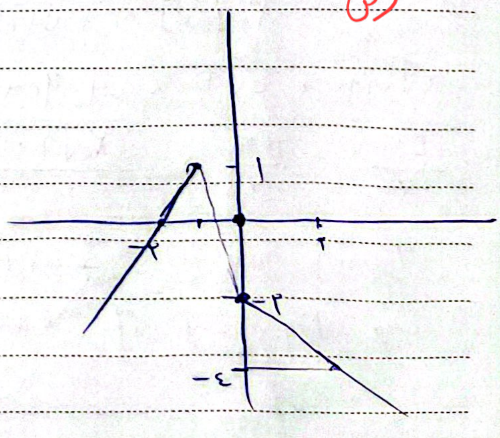
$y_{min} = 2$



(5) ۳

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

$x < -1$	-1 to 0	$x > 0$
$-x + 2x + 2 = x + 2$	$-x - 2x - 2 = -3x - 2$	$x - 2x - 2 = -x - 2$



$R_f = (-\infty, 1]$

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(۶)

$y=\frac{x^2+5x+m}{x+1} \to yx+y=x^2+5x+m \to x^2+5x-yx+m-y$

$x^2+(5-y)x+(m-y)$

(۳)

$\Delta \ge 0 \to (5-y)^2-4(m-y) = y^2-6y+25-4m \ge 0$

$\Delta \le 0 \to 36-4(25-4m) \Rightarrow -64+16m \le 0$

$16m \le 64 \to m \le 4$

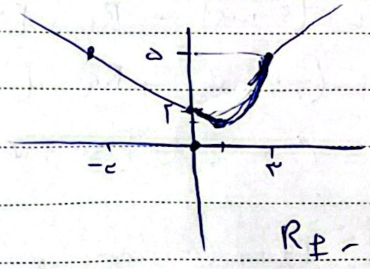
$\frac{x^2+5x+4}{x+1}=\frac{(x+1)(x+4)}{x+1}$ اگر به جای m عدد ۴ بذاریم

و این جواب دامنه $\leftarrow$ $R-\{1\}$ که در این صورت به ازای ۳ عدد طبیعی $\{1,2,3\} \Leftarrow m \le 4$

(۷)

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

(۲)



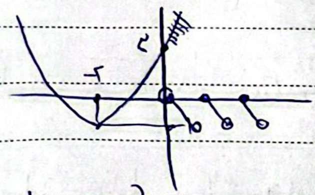
$x^2-2x+2 \longrightarrow (x-1)^2+1 \to$

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

(۸)

$f(x)=\begin{cases} x^2+4x+3 & x<0 \\ [2x]-2x & x \ge 0 \end{cases} \to (x+1)(x+3)$

$\left| \begin{array}{l} -\frac{b}{2a}=\frac{-4}{2}=-2 \\ 4-8+3=-1 \end{array} \right.$



(۲)

$[\{\}]-\{\} \to (-1 \quad 0]$

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

(۹)

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

$D_f \Rightarrow 2x+3 \ge 0 \to 2x \ge -3 \to x \ge -\frac{3}{2}$

$\max y = a+1 = 5 \to a=4$

(۲)

$D_f=[-\frac{3}{2} \quad +\infty) \longrightarrow b=-\frac{3}{2}$

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

(۱۰)

$f(x)=2\sqrt{x+1}+4\sqrt{1-x} \to D_f=[-1 \quad 1]$

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

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

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

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

(۲)

$y=\sqrt{1-x}$

$D_f=D_g=[-1 \quad 1]$ $\begin{array}{l} \min y = 0 \\ \max y = \sqrt{2} \end{array} \Big\} \ [0 \quad \sqrt{2}]$