

Subject: Math

Year: Month: Date: ()

دریاضیات

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

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

(1)

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

$$\frac{-1}{-1} \frac{1}{1}$$

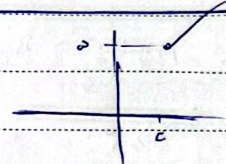
$$D = [-1, 1]$$

$$f(g(-1)) - cf(-1) = 1 - 0 = 1$$

$$1 + 2 + 2 = 5$$

$$f(g(0)) - cf(0) = 1 - 1 = 0$$

$$f(g(1)) - cf(1) = 0 - 0 = 0$$

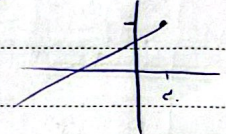


(2)

$$f(x) = \ln x \rightarrow D_f = (0, +\infty) \rightarrow R_f = (-\infty, +\infty)$$

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

$$(-\infty, c] \cup [c, +\infty)$$



$$y = -\frac{1}{2}x^2 + x + 2$$

$$f_y \rightarrow (a, b) \rightarrow (\frac{c}{a}, +\infty)$$

(3)

$$(-\frac{1}{2}x^2 + x + 2 > \frac{c}{2}) \times 2 \rightarrow -x^2 + 2x + 4 > c \rightarrow x^2 - 2x - 4 < -c$$

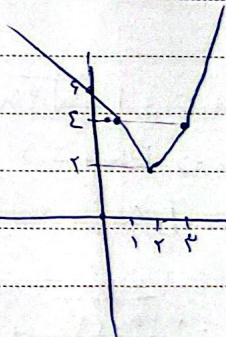
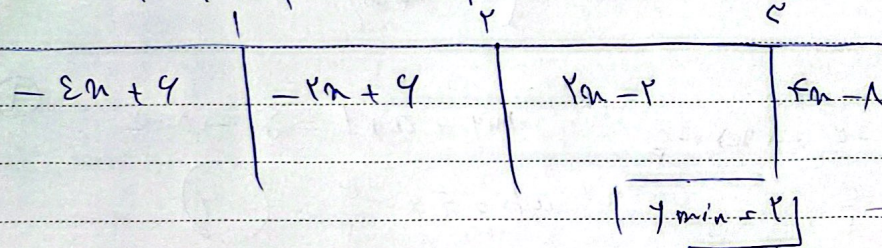
$$(x-c)(x+1) < 0$$

$$\frac{-1}{+2} \frac{c}{-4}$$

$$\sqrt{b-a} = \sqrt{c} = 2$$

$$D_f = \left(\frac{-1}{2}, \frac{c}{2} \right)$$

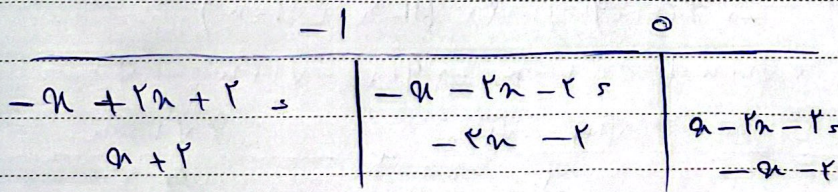
$$y = |x-1| + |x-2| + |x-3|$$



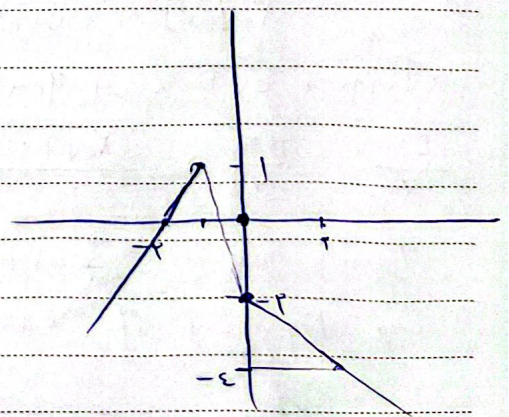
(4)

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

(5)



$$R_f = (-\infty, 1]$$



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

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

$$\Delta \geq 0 \rightarrow (2-y)^2 - 4(m-y) \geq 0 \rightarrow y^2 - 4y + 4m - 4y + 4 = 0$$

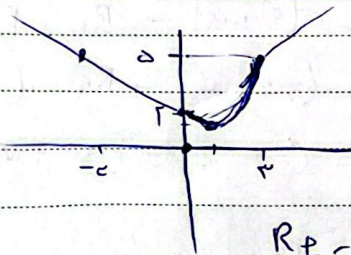
$$\Delta \geq 0 \rightarrow y^2 - 8y + 4m \geq 0 \rightarrow -4 \leq y \leq 4m$$

$$14m \leq 4 \leq -m \leq 4$$

$$\frac{x^2 + 2x + 2}{x+1} = \frac{(x+1)(x+1)}{(x+1)}$$

مقدار $\Delta \geq 0 \Rightarrow \{1, 2, 3\}$ و اینها را در این صورت قرار دهیم و جوابها را بدست آوریم

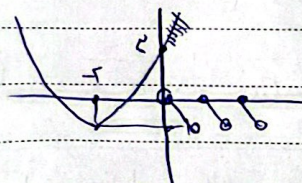
$$f(x) = \begin{cases} x+2 & x > 2 \\ x^2 - 2x + 2 & 0 \leq x \leq 2 \\ |x| + 2 & x < 0 \end{cases}$$



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

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

$$f(x) = \begin{cases} x^2 + 2x + 2 & x < -1 \\ [2x] - 2x & x \in [-1, 1] \\ [x] - x & x > 1 \end{cases}$$



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

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

$$D_f \Rightarrow [x+2] \geq 0 \rightarrow x \geq -2 \rightarrow x \geq -\frac{c}{a}$$

$$m_y = a+1 = 2 \rightarrow a = 1$$

$$D_f \Rightarrow [-\frac{c}{a} + \infty) \rightarrow b = -\frac{c}{a}$$

$$a \leq x \leq -\frac{c}{a} \Rightarrow (-9)$$

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

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

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

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

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

$$y = \sqrt{1-x}$$

$$\begin{cases} \min y = 0 \\ \max y = 1 \end{cases} \Rightarrow [0, 1]$$

$$D_f = D_g = [-1, 1]$$