

(1)

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

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

$$D_f = 1-x^2 \geq 0 \Rightarrow (1-x)(1+x) \geq 0$$

$$\Rightarrow D_f = [-1, 1]$$

$$\begin{cases} f(-1) = \sqrt{1-1} = 0 \xrightarrow{x^3} = 0 \\ f(0) = \sqrt{1-0} = 1 \xrightarrow{x^3} = 1 \\ f(1) = 0 \xrightarrow{x^3} = 0 \end{cases}$$

$$f \cdot g - f \cdot f = ?$$

$$\Rightarrow f \cdot g - f \cdot f = \{1, 0, 1\} \leftarrow \text{جوابی}$$

(2)

$$\begin{cases} f(x) = 2x-1 \\ D_f = [1, +\infty) \end{cases} \quad R_f \Rightarrow f(1) - 1 = 0 \quad \begin{cases} g(x) = \frac{1}{x}x + 1 \\ D_g = (-\infty, 1] \end{cases} \quad R_g \Rightarrow \frac{1}{x}(1) + 1 = 2$$

$$R_f \cup R_g = \mathbb{R} - (1, 2)$$

(3)

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

$$\rightarrow -x^2 + x + 1 > c \Rightarrow 0 > x^2 - x - 1$$

$$\sqrt{b-a} = 1 \quad \frac{-1 \pm \sqrt{1+4}}{2} \quad \begin{pmatrix} -1, 2 \\ a, b \end{pmatrix}$$

(4)

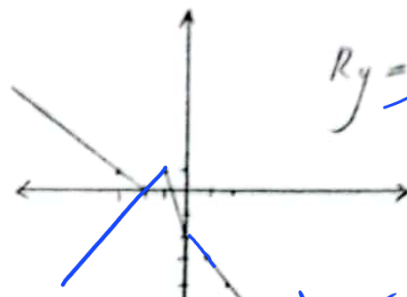
$$y = \underbrace{|x-1|}_{(1)} + \underbrace{|x-2|}_{(2)} + \underbrace{|x-3|}_{(3)}$$

$$y = \begin{cases} -x+1 & x < 1 \\ -2x+3 & 1 \leq x < 2 \\ x-1 & 2 \leq x < 3 \\ 4-x-1 & x \geq 3 \end{cases} \Rightarrow \begin{cases} x=1 \rightarrow -2(1)+3=1 \\ x=2 \rightarrow 2(2)-2=2 \\ x=3 \rightarrow 4(3)-1=11 \end{cases}$$

جواب

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

$$y = \begin{cases} x+1 & x < -1 \\ -3x-1 & -1 \leq x \leq 0 \\ -x-1 & x > 0 \end{cases}$$



$$R_y = \mathbb{R} - (-1, -1)$$

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

1,50

$$m = -x \rightarrow \frac{x + \Delta x + 1}{x+1} = 2 + \frac{1}{x+1}, \frac{2 + -1}{x+1}$$

$$y = \frac{x^2 + \Delta x + m}{x+1} \quad R_y = \mathbb{R} \quad yx + y = x^2 + \Delta x + m \quad x^2 + \Delta x + m - yx - y = 0$$

$$x^2 + x(\Delta - y) + (m - y) = 0 \Rightarrow x = \frac{y - \Delta \pm \sqrt{(\Delta - y)^2 - 4(1)(m - y)}}{2} \quad \Delta \geq 0$$

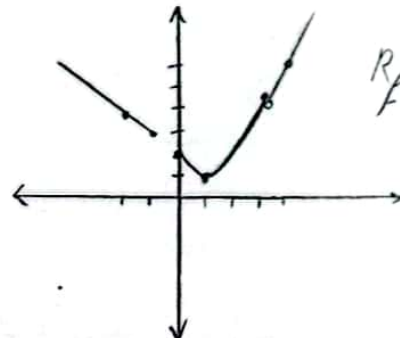
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$$2\Delta - 1 - y + y^2 - 4m + 4y \geq 0 \Rightarrow y^2 - 4y + 2\Delta - 4m \geq 0 \quad \Delta \leq 0$$

اینجا باید این عبارت را به دست آوریم و آن را به دست آوریم

$$\Delta y = \frac{(-4)^2 - 4(1)(2\Delta - 4m)}{4} \leq 0 \Rightarrow 14m \leq 4\Delta \Rightarrow m \leq \frac{1}{4} \Delta \quad \{1, 2, 3, 4\}$$

$$f(x) = \begin{cases} x+1 & x \geq 1 \\ x^2 - 2x + 1 & 0 \leq x < 1 \\ |x| + 1 & x < 0 \end{cases}$$



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

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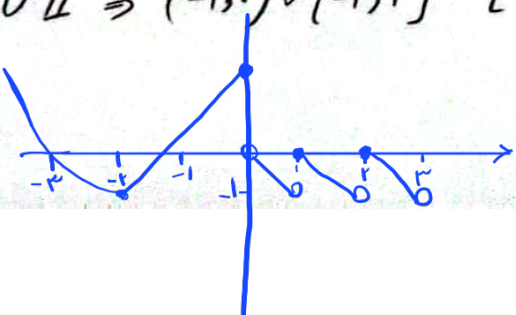
$$f(x) = \begin{cases} x^2 + 1 & x \leq -1 \\ [1x] - 1 & x > -1 \end{cases} \rightarrow \begin{cases} x = -\frac{b}{2a} = -\frac{1}{2} = -1 \\ y = (-1)^2 + 1(-1) + 1 = -1 \end{cases}$$

1

$$(I) x \leq -1, a = 1 \quad (II) x > -1 \Rightarrow f(x) = [1x] - 1 \Rightarrow [1x] \leq 1x < [1x] + 1$$

$$[1x] - 1 \in (-1, 0] \quad / \quad f(0) = 0^2 + 1(0) + 1 = 1 \rightarrow R_y = [-1, 1] \quad (I)$$

$$I \cup II \Rightarrow (-1, 0] \cup [-1, 1] = [-1, 1] \leftarrow \text{جواب}$$



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

$$y = a + 1 - \sqrt{rx + r} \quad D_y = [b, +\infty) \quad R_y = (-\infty, a] \quad ab = ?$$

$$rx + r \geq 0 \Rightarrow rx \geq -r \Rightarrow x \geq -\frac{r}{r} \rightarrow \left[-\frac{r}{r}, +\infty\right) \xrightarrow{b}$$

$$y: \sqrt{rx + r} \geq 0 \xrightarrow{x(-1)} -\sqrt{rx + r} \leq 0 \Rightarrow \underbrace{a + 1 - \sqrt{rx + r}}_y \leq a + 1$$

$$y \leq a + 1 \rightarrow R_y = (-\infty, a + 1] \quad \begin{matrix} a + 1 = a \\ \Rightarrow a = r \end{matrix}$$

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$$ab = r \times -\frac{r}{r} = -r \quad \text{جواب}$$

$$f(x) = r\sqrt{x+1} + r\sqrt{1-x} \quad y = \frac{f(x)}{r} - \sqrt{r+r\sqrt{1-x^2}} + \frac{f(x)}{r}$$

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

$$D_f = D_g \quad y = \frac{f(x)}{r} - \frac{g(x)}{r} = \frac{1}{r}f(x) - \sqrt{r+r\sqrt{1-x^2}}$$

$$\Rightarrow \frac{1}{r}(r\sqrt{x+1} + r\sqrt{1-x}) - \sqrt{r+r\sqrt{1-x^2}}$$

$$y = \sqrt{x+1} + \sqrt{1-x} - \sqrt{r+r\sqrt{1-x^2}} \quad -1 \leq x \leq 1$$

$$x = 1 \xrightarrow{y}$$

$$x = -1 \xrightarrow{\sqrt{r}}$$

$$x = 0 \xrightarrow{1}$$

$$R = [-, \sqrt{r}]$$