

$$A = \{1, 2, 3\} \quad B = \{2, 3\} \quad B^2 = B \times B = \{(2, 2), (2, 3), (3, 2), (3, 3)\}$$

$$A \times B - B^2$$

$$A \times B = \{(1, 2), (1, 3), (2, 2), (2, 3), (3, 2), (3, 3)\}$$

$$A \times B - B^2 = \{(1, 2), (1, 3)\}$$

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الف) $f(n) = \{(2, m^2), (2, 1), (-3, m), (2, m+2), (m, 4)\}$

$$m^2 = m+2 \quad m^2 - m - 2 = 0 \quad (m-2)(m+1) = 0 \quad m = 2 \vee m = -1$$

if $m = 2 \rightarrow (2, 4), (-3, 2), (2, 4), (2, 1), (2, 4)$

if $m = -1 \rightarrow (2, 1), (2, 1), (-3, -1), (2, 1), (-1, 4)$ ✓ m = -1

ب) $g(n) = \{(2, m^2), (2, 1), (m, 4), (2, m+2), (-2, m), (-1, 4)\}$

$$m^2 - m - 2 = 0 \quad (m-2)(m+1) = 0 \quad m = 2 \vee m = -1$$

if $m = 2 \rightarrow (2, 4), (2, 1), (2, 4), (2, 4), (-2, 2), (-1, 4)$

if $m = -1 \rightarrow (2, 1), (2, 1), (-1, 4), (-1, 4), (2, 1), (-2, -1)$

به اشیای هیچ وجه

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$$a \times b = ?$$

$$\text{if } n = 1 \quad x^2 - 1 = an + b \Rightarrow 1 - 1 = a + b = 0$$

$$f(n) = \begin{cases} x^2 - 1 & ; x \leq 1 \\ an + b & ; 1 \leq n \leq 2 \\ x^2 & ; n \geq 2 \end{cases}$$

$$\text{if } n = 2 \quad an + b = n^2 \Rightarrow 2a + b = 1$$

$$\begin{cases} 2a + b = 1 \\ a + b = 0 \end{cases}$$

$$a \times b = 1 \times (-1) = -1$$

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$$a = 1 \quad , \quad b = -1$$

$$f(x) = \begin{cases} 2x - 3 & ; x \geq 1 \\ 4 - 3x & ; x \leq 1 \end{cases}$$

$$\rightarrow \begin{cases} x \geq \frac{4}{3} \\ x \leq \frac{4}{3} \end{cases}$$

$$2x - 3 = 4 - 3x$$

$$5x = 7$$

$$x = \frac{7}{5} = 1.4$$

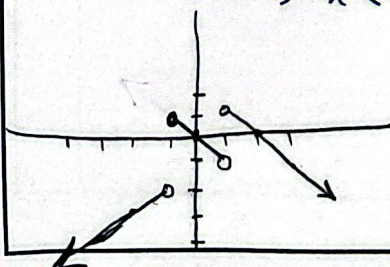
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$$f(x) = \begin{cases} -x + 2 & ; x > 1 \rightarrow \begin{array}{ccc|c} 1 & 2 & 3 \\ + & 1 & 0 & -1 \\ \hline 1 & 1 & 0 & -1 \end{array} \\ -x & ; -1 \leq x < 1 \rightarrow \begin{array}{ccc|c} 1 & 0 & -1 \\ + & -1 & 0 & -1 \\ \hline 1 & -1 & 0 & -1 \end{array} \\ x - 1 & ; x < -1 \rightarrow \begin{array}{ccc|c} 1 & -1 & -1 \\ + & -1 & -1 & -1 \\ \hline 1 & -2 & -2 & -1 \end{array} \end{cases}$$

$$D_f = \mathbb{R} - \{1\}$$

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

شکل داده شده



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$$\text{الف) } xy^2 + x^2 + 1 = 0$$

$$xy^2 = -x^2 - 1$$

$$xy^2 = -x^2 - 1$$

$$xy^2 = xy^2$$

$$x_1 = y_1 \quad \text{تابع مستقيم}$$

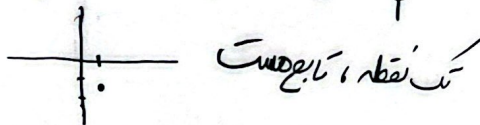
$$\text{ب) } x^2 + xy^2 - 2x - 12y + 10 = 0$$

$$x^2 + xy^2 - 2x - 12y + 1 + 9 = 0$$

$$(x-1)^2 + (y+3)^2 = 0$$

$$x-1=0 \quad x=1$$

$$y+3=0 \quad y=-3 \quad y = -\frac{3}{1}$$



نقطه واحد تابع مستقيم

$$\text{الف) } x \sin y = y \sin x$$

$$\frac{\sin y}{y} = \frac{\sin x}{x}$$

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ببینیم

$$\frac{\sin y}{y} = 0 \quad \sin y = 0$$

$$y = 0, \pm\pi, \pm2\pi, \dots$$

تابع مستقيم

$$\text{ب) } \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$$

$$\sqrt{\frac{x}{y}} + \frac{y}{x} + \sqrt{\frac{y}{x}} = 2$$

$$\frac{x}{y} + \frac{y}{x} = 2$$

$$\frac{x^2 + y^2}{xy} = 2 \Rightarrow x^2 + y^2 - 2xy = 0$$

$$(x-y)^2 = 0 \Rightarrow y = x$$

تابع مستقيم

$$\text{الف) } y = \sqrt{\frac{x-1}{x-2}} + \sqrt{\frac{x-2}{x}}$$

$$x \neq 0$$

$$\frac{x-2}{x} \geq 0$$

$$\frac{0}{x} + \frac{r}{x} =$$

$$\frac{x-2}{x-2} \geq 0 \quad \frac{1}{x-2} \geq 0$$

$$(-\infty, 2) \cup (2, +\infty)$$

$$\text{①} \cap \text{②} \rightarrow (0, 2) \cup (2, +\infty) = D_f$$

$$\text{ب) } \sqrt{x} + \sqrt{y-1} = \sqrt{3}$$

$$\sqrt{y-1} = \sqrt{3} - \sqrt{x}$$

$$x \geq 0 \quad [0, +\infty) = D_f$$

$$\text{الف) } y = \frac{\sqrt{x^2 - 5x + 4}}{\sqrt{x^2 - 10x + 14}} = \frac{\sqrt{(x-4)(x-1)}}{\sqrt{(x-1)(x-2)}}$$

$$\frac{1}{x-4} + \frac{1}{x-1} + \frac{1}{x-2} + \frac{1}{x-1} =$$

$$\text{①} \cap \text{②} \rightarrow (-\infty, 1] \cup (1, +\infty) = D_f$$

$$\text{ب) } y = \sqrt{\frac{x^2 - 5x + 4}{x^2 - 10x + 14}} = \sqrt{\frac{(x-4)(x-1)}{(x-1)(x-2)}} = \sqrt{\frac{x-4}{x-2}}$$

$$D_f = (-\infty, 1] \cup (2, 4] \cup (4, +\infty)$$

$$\text{الف) } y = \frac{\sqrt{4x^2 - 2x + 1}}{\sqrt{4x^2 - 10x + 14}} = \frac{\sqrt{x^2 - \frac{1}{2}x + \frac{1}{4}}}{\sqrt{x^2 - \frac{5}{2}x + \frac{7}{2}}}$$

$$\frac{1}{x - \frac{1}{4}} + \frac{1}{x - \frac{1}{2}} + \frac{1}{x - \frac{7}{2}} + \frac{1}{x - \frac{5}{2}} =$$

$$\text{ب) } y = \sqrt{\frac{4x^2 - 2x + 1}{4x^2 - 10x + 14}} = \sqrt{\frac{x^2 - \frac{1}{2}x + \frac{1}{4}}{x^2 - \frac{5}{2}x + \frac{7}{2}}}$$

$$\frac{1}{x - \frac{1}{4}} + \frac{1}{x - \frac{1}{2}} + \frac{1}{x - \frac{7}{2}} + \frac{1}{x - \frac{5}{2}} =$$

$$D_f = (-\infty, 1] \cup (2, +\infty)$$

نقطه

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