

$$A \times B = B^2$$

$$B = \{1, 2\}, A = \{1, 2, 3\}$$

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

$$B \times B \rightarrow \{(2, 2), (2, 3), (3, 2), (3, 3)\}$$

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

2. معادله را ضمیمه کردن و جواب را به دست آوردن

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

$$g(x) = \{(3, m^2), (2, 1), (m, 4), (3, m+2), (-2, m), (-1, 3)\}$$

$$m^2 = m + 2 \rightarrow m^2 - m - 2 = 0 \rightarrow \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow \frac{1 + \sqrt{1 - 4(1)(-2)}}{2} = \frac{1 + \sqrt{9}}{2} = 2$$

$$\frac{1 - \sqrt{1 - 4(1)(-2)}}{2} = \frac{1 - 3}{2} = -1$$

$$ax^2 + bx + c = 0 \text{ if } a + c = b \rightarrow x = -1$$

$$x = -\frac{c}{a}$$

$$x = -1 \rightarrow \{(3, 1), (2, 1), (-3, 1), (-2, 1), (3, 1), (-1, 4)\} \rightarrow m = -1$$

$$x = 2 \rightarrow \{(3, 4), (2, 1), (-3, 2), (-2, 2), (3, 4), (2, 4)\}$$

$$\{(3, m^2), (2, 1), (m, 4), (3, m+2), (-2, m), (-1, 3)\}$$

$$m^2 = m + 2 \rightarrow m^2 - m - 2 = 0 \rightarrow a + c = b \rightarrow -\frac{c}{a} = 2$$

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

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

axb

$$f(x) = \begin{cases} x^2 - 1 & ; x \leq 1 \\ ax + b & ; 1 < x \leq 2 \\ x^3 & ; x > 2 \end{cases}$$

$$x^2 - 1 \xrightarrow{(1)} 0 \rightarrow b + b = 0 \rightarrow a = -b$$

$$ax + b \xrightarrow{(1)} a + b$$

$$ax + b \xrightarrow{(2)} 2a + b \rightarrow 2a + b = 8$$

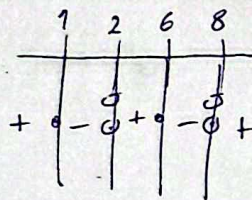
$$x^3 \xrightarrow{(3)} 8$$

$$\begin{cases} a + b = 0 \\ 2a + b = 8 \end{cases} \Rightarrow a = 8, b = -8$$

$$a + b = 8 + (-8) = 0$$

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$$b) \sqrt{\frac{x^2 - 7x + 6}{x^2 - 10x + 16}} \quad \begin{matrix} \textcircled{1} & \textcircled{6} \\ (x-1)(x-6) \\ \textcircled{2} & \textcircled{8} \\ (x-2)(x-8) \end{matrix}$$



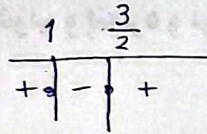
$$D_f = (-\infty, 1] \cup (2, 6] \cup (8, +\infty)$$

$$a) = \sqrt{\frac{2x^2 - 5x + 3}{3x^2 - 7x + 4}} \rightarrow 1, \frac{3}{2}$$

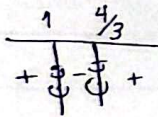
if $ax^2 + bx + c = 0$ $a + b + c = 0$ $\rightarrow x = 1$
 $\rightarrow x = \frac{c}{a}$

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$$\sqrt{3x^2 - 7x + 4} \rightarrow 1, \frac{4}{3}$$

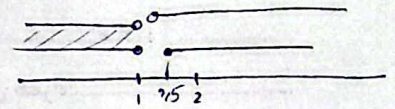


$$(-\infty, 1] \cup [\frac{3}{2}, +\infty) \text{ I}$$



$$(-\infty, 1) \cup (\frac{4}{3}, +\infty) \text{ II}$$

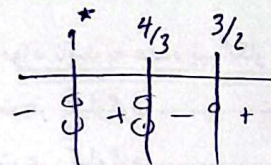
$$I \cap II \rightarrow$$



$$(-\infty, 1) \cup [\frac{3}{2}, +\infty)$$

if $ax^2 + bx + c = 0$ $a + b + c = 0$ $\rightarrow x = 1$
 $\rightarrow x = \frac{c}{a}$

$$b) y = \sqrt{\frac{2x^2 - 5x + 3}{3x^2 - 7x + 4}} \rightarrow 1, \frac{3}{2}$$



$$D_f = (1, \frac{4}{3}) \cup [\frac{3}{2}, +\infty)$$

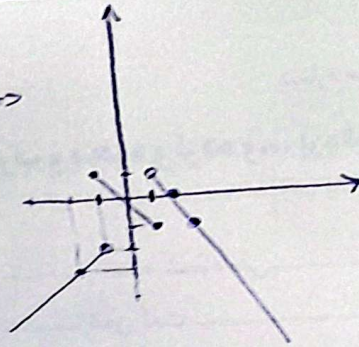
$$f(x) = \begin{cases} 2x-3 & ; x > k \\ 4-3x & ; x < k \end{cases}$$

$$\begin{aligned} 2x-3 &\xrightarrow{k} 2k-3 \\ 4-3x &\xrightarrow{k} 4-3k \end{aligned}$$

$$\begin{aligned} 2k-3 &= 4-3k \\ 5k &= 7 \rightarrow k = \frac{7}{5} \end{aligned}$$

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$$f(x) = \begin{cases} -x+2 & ; x > 1 \\ -x & ; -1 < x < 1 \\ x-1 & ; x < -1 \end{cases} \Rightarrow$$



$$\text{مثال 1) } 2y^3 + x^2 + 1 = 0$$

$$\text{منه نقض} \\ \text{if } x=1$$

$$2y^3 + 1 + 1 = 0$$

$$2y^3 = -2 \quad y = -1 \checkmark$$

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$$\text{ب) } x^2 + 4y^2 - 2x - 12y + 10 = 0$$

$$(x-1)^2 + (y-6)^2 = 17$$

$$\text{if } x=2 \rightarrow (2-1)^2 = 1$$

$$(x-1)^2 + (y-6)^2 - 17 = 0$$

$$(y-6)^2 = 16 \rightarrow \begin{aligned} y &= 10 \\ y &= 2 \end{aligned} \quad x$$

$$\text{مثال 2) } x \sin y = y \sin x$$

$$x = \frac{\pi}{2} \quad y = 1 \quad \left(\sin \frac{\pi}{2} y = \frac{\pi}{2} \sin y \right) \Rightarrow y = \frac{\pi}{2} \sin y \quad \text{Idk} \dots \text{تجريب}$$

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

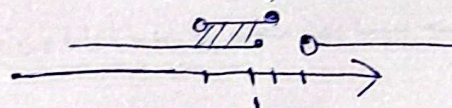
$$x=1$$

$$\sqrt{\frac{1}{y}} + \sqrt{y} = 2 \rightarrow y=1 \quad \sqrt{2}$$

$$\text{مثال 3) } y = \sqrt{\frac{n-1}{n-3}} + \sqrt{\frac{2-n}{n}} \\ + \sqrt{\frac{1}{n-3}} + \sqrt{\frac{2}{n}}$$

$$(-\infty, 1] \cup (1, +\infty) \cap (0, 1] = (0, 1]$$

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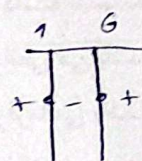
$$\text{ب) } \sqrt{n} + \sqrt{y-1} = \sqrt{4}$$

$$\begin{aligned} n &\geq 0 \\ y-1 &\geq 0 \rightarrow y \geq 1 \end{aligned}$$

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$$\text{مثال 4) } \frac{\sqrt{x^2 - 7x + 6}}{\sqrt{x^2 - 10x + 16}}$$

$$\begin{aligned} \text{①} \quad (x-1)(x-6) \\ \text{②} \quad (x-2)(x-8) \end{aligned}$$



$$(-\infty, 1] \cup [6, +\infty) \text{ I}$$

$$(-\infty, 2) \cup (8, +\infty) \text{ II}$$

$$\text{I} \cap \text{II} \rightarrow \begin{aligned} &(-\infty, 1] \cup [8, +\infty) \\ &(-\infty, 2) \cup (8, +\infty) \end{aligned}$$