

$$\begin{cases} x^2 - 1 & x < 1 \xrightarrow{x=1} (1)^2 - 1 = 0 \\ ax + b & 1 \leq x \leq 1 \xrightarrow{x=1} a + b = 0 \rightarrow a = -b \rightarrow b = -a \\ x^2 & x > 1 \xrightarrow{x=1} 1a - a = 1 \rightarrow a = 1 \rightarrow b = -1 \\ & \xrightarrow{x=2} 1 \end{cases} \quad \begin{aligned} & a \times b = 1 \times -1 = -1 \end{aligned}$$

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$$\begin{cases} 2x - 3 & x \geq K \xrightarrow{x=K} 2K - 3 \\ F - 2x & x \leq K \xrightarrow{x=K} F - 2K \end{cases} \Rightarrow \begin{aligned} 2K - 3 &= F - 2K \\ \Delta K &= 3 \\ K &= \frac{F}{4} \end{aligned}$$

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الف) $y^2 - 4y \rightarrow$ تابع نیست بر اساس y نام

ب) $|x| + |y| = 3 \rightarrow x = 0 \quad y = \pm 3$ تابع نیست

ج) $|y| = \sqrt{1 - \cos x} \rightarrow x = 90^\circ \rightarrow |y| = \sqrt{\frac{1}{2}} \rightarrow y = \pm \frac{1}{\sqrt{2}}$ تابع نیست

د) $y' + (x+1)^2 = 0 \rightarrow y = 0 \quad x = -1$ تابع نیست

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الف) $x_1 \rightarrow 2x_1 - 2 - x_1^2 = \sqrt[3]{y_1} \quad x_2 \rightarrow 2x_2 - 2 - x_2^2 = \sqrt[3]{y_2}$

ب) $x_1 = x_2 \rightarrow \sqrt[3]{y_2} = \sqrt[3]{y_1} \rightarrow y_1 = y_2$ تابع هست

ج) $y_1^2 + 2y_1 = 2x_1 \quad y_2^2 + 2y_2 = 2x_2 \xrightarrow{x_1=x_2} y_1^2 + 2y_1 = y_2^2 + 2y_2$

$y_1^2 - y_2^2 + 2(y_1 - y_2) = 0 \rightarrow (y_1 - y_2)(y_1 + y_2 + 2) = 0$

$y_1 = y_2$ همیشه مثبت

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الف) $x = 110^\circ \quad 110 \times \sin y = y \times \sin 110$

$110 \times \sin y = y \times 0 \quad 0 \quad 0$

$\sin y = 0 \rightarrow y = 0^\circ \quad 110^\circ \quad 190^\circ$ تابع نیست

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ب) $a = \sqrt{\frac{x}{y}} \quad b = \sqrt{\frac{y}{x}} \rightarrow \frac{a+b}{2} \geq \sqrt{ab} \rightarrow a+b \geq 2\sqrt{ab}$

$\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} \geq 2\sqrt{\sqrt{\frac{x}{y}} \sqrt{\frac{y}{x}}} \rightarrow \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} \geq 2 \rightarrow a=b$

$\frac{x}{y} = \frac{y}{x} \Rightarrow x^2 = y^2 \Rightarrow |x| = |y|$ تابع هست

الف) $x^2 - 5x - 24 \rightarrow (x - 9)(x + \frac{4}{3}) \rightarrow x = +\frac{4}{3}$
 $\rightarrow x = -\frac{4}{3}$

ب) $x^2 - 17x - 9 \rightarrow (x + \frac{1}{3})(x - 9) \rightarrow x = +9$
 $\rightarrow x = -\frac{1}{3}$

ج) $x^2 - 6x - 12 \rightarrow (x - \frac{6}{5})(x + \frac{1}{5}) \rightarrow x = +\frac{6}{5}$
 $\rightarrow x = -\frac{1}{5}$

د) $x^2 - 5x - 24 \rightarrow (x - \frac{1}{3})(x + \frac{4}{3}) \rightarrow x = +\frac{4}{3}$
 $\rightarrow x = -\frac{4}{3}$

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الف) $(x - 7)(x + 2) \rightarrow x = +7$
 $\rightarrow x = -2$

ب) $(x + \frac{3}{2})(x + \frac{4}{2}) \rightarrow x = -\frac{3}{2}$
 $\rightarrow x = -\frac{4}{2}$

ج) $\Delta < 0 \rightarrow$ هیچ راه حلی ندارد

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د) $\frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \frac{-3 \pm \sqrt{33}}{2} \rightarrow \frac{-3 + \sqrt{33}}{2}$

$\Delta = 33$

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

$B^T = \{(2, 2), (2, 3), (3, 2), (3, 3)\}$

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

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الف) $m^2 = m + 2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m - 2)(m + 1) \rightarrow m = +2$
 $\rightarrow m = -1$

ب) $m^2 = m + 2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m - 2)(m + 1) \rightarrow m = +2$
 $\rightarrow m = -1$

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$a^2 = 3a - 2 \rightarrow a^2 - 3a + 2 = 0 \rightarrow (a - 1)(a - 2) \rightarrow a = +1$
 $\rightarrow a = +2$

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