

الف) $x^2 - 5x + 6 = 0$ $(x-2)(x-3) = 0$ $x_1 = \frac{5 \pm \sqrt{25-24}}{2} = \frac{5 \pm 1}{2}$ $x_1 = \frac{6}{2} = 3, x_2 = \frac{4}{2} = 2$	ب) $x^2 - 10x + 9 = 0$ $(x-9)(x-1) = 0$ $x_1 = \frac{10 \pm \sqrt{100-36}}{2} = \frac{10 \pm 8}{2}$ $x_1 = \frac{18}{2} = 9, x_2 = \frac{2}{2} = 1$	ج) $x^2 - 5x - 14 = 0$ $(x-7)(x+2) = 0$ $x_1 = \frac{5 \pm \sqrt{25+112}}{2} = \frac{5 \pm 11}{2}$ $x_1 = \frac{16}{2} = 8, x_2 = \frac{-6}{2} = -3$	1
د) $x^2 - 5x - 24 = 0$ $(x-8)(x+3) = 0 \rightarrow x_1 = \frac{5 \pm \sqrt{25+192}}{2} = \frac{5 \pm 14}{2}$ $x_1 = \frac{19}{2} = 9.5, x_2 = \frac{-9}{2} = -4.5$			

الف) $(x-7)(x+2) = 0$ $x_1 = -2, x_2 = 7$	ج) $\Delta = b^2 - 4ac = 4 - 4(3)(1) = 4 - 12 = -8$ $\Delta < 0$ جواب ندارد	2
ب) $x^2 + 5x + 6 = 0$ $(x+3)(x+2) = 0$ $x_1 = \frac{-5 \pm \sqrt{25-24}}{2} = \frac{-5 \pm 1}{2}$ $x_1 = \frac{-4}{2} = -2, x_2 = \frac{-6}{2} = -3$	د) $\Delta = 9 - 4(3)(-2) = 9 + 24 = 33$ $x_1 = \frac{-3 \pm \sqrt{33}}{2}$	

$A \times B = \{(1,2), (1,3), (2,3), (2,4), (3,4), (3,5)\}$ $B \times B = B^2 = \{(2,3), (2,4), (3,4), (3,5)\}$	3
$A \times B - B^2 = \{(1,2), (1,3)\}$	

الف) $m^2 = m + 2$ $m^2 - m - 2 = 0$ $(m-2)(m+1) = 0$ $m_1 = 2, m_2 = -1$ $m = 2$ (مطلوب)	ب) $m^2 = m + 2$ $m^2 - m - 2 = 0$ $(m-2)(m+1) = 0 \rightarrow m_1 = 2, m_2 = -1$ $m = 2$ (مطلوب)	4
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$a^2 - 3a - 2 = 0$ $a^2 - 3a + 2 = 0$ $(a-1)(a-2) = 0$ $a_1 = 1, a_2 = 2$ $a = 1$ و $a = 2$ (تایید)	$\{ (1,4), (2,4), (1,8), (2,8) \}$ $\{ (1,4), (2,4) \}$ $\{ (1,8), (2,8) \}$ $a = 1$ و $a = 2$ (تایید)	5
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$\begin{aligned} x=1 &\rightarrow x^2-1 = a x + b \\ &0 = a + b \end{aligned}$ $\begin{aligned} x=2 &\rightarrow a x + b = x^3 \\ &2a + b = 1 \end{aligned}$	$\begin{cases} a + b = 1 \rightarrow -b = 1 \rightarrow b = -1 \\ a + b = 1 \rightarrow a = 2 \end{cases}$ $a x + b = 2x - 1 = x^3$	6
$\begin{aligned} x=k &\rightarrow v k - w = r - w k \\ &w k = v \\ &k = \frac{v}{w} \end{aligned}$		7
$\begin{aligned} \text{الف) } x=1 &\rightarrow y(y^2-5)=0 \quad \text{تابع نیست} \\ &y=0, -\sqrt{5}, +\sqrt{5} \end{aligned}$	$\begin{aligned} \text{ب) } x=4 &\rightarrow y = \sqrt{1-0} = 1 \\ &y = \pm 1 \quad \text{تابع نیست} \end{aligned}$	8
$\begin{aligned} \text{الف) } x=1 &\rightarrow y = 2 \rightarrow y = \pm 2 \quad \text{تابع نیست} \end{aligned}$	$\begin{aligned} \text{ب) } y^2 + (x+1)^2 &= 0 \\ x=1, y=0 &\rightarrow \begin{vmatrix} -1 \\ 0 \end{vmatrix} \quad \text{تابع نیست} \end{aligned}$	
$\begin{aligned} \text{الف) } \sqrt[3]{y_1} &= \sqrt[3]{y_2} \\ y_1 &= y_2 \\ &\text{تابع هست} \end{aligned}$ $\sqrt[3]{y} = 2x - 2 - x^2$	$\begin{aligned} \text{ب) } y_1^3 + y_2^3 &= y_1^3 + y_2^3 \\ y_1^3 - y_2^3 + 2(y_1 - y_2) &= 0 \quad \text{تابع نیست} \\ (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) + 2(y_1 - y_2) &= 0 \\ (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 2) &= 0 \\ \Delta = y_2^2 - 4(1)(y_1^2 + 2) &= -3y_2^2 - 8 \end{aligned}$	9
$\begin{aligned} \text{الف) } x=0 &\rightarrow y \text{ فردی و زوج باشد} \\ &\text{تابع نیست} \end{aligned}$	$\begin{aligned} \text{ب) } a + \frac{1}{a} &= 2 \\ a^2 - 2a + 1 &= 0 \\ (a-1)^2 = 0 &\rightarrow a=1 \rightarrow \sqrt{\frac{x}{y}} = 1 \\ &\text{تابع هست} \rightarrow x=y \end{aligned}$	10