

الف) $4x^2 - 5x - 4 = 0 \rightarrow a=4, b=-5, c=-4$ $a \times c = 4 \times (-4) = -16 \rightarrow x^2 - 5x - 16 = 0 \rightarrow (x-9)(x+1) = 0$ $a=4 \rightarrow (x-\frac{9}{4})(x+\frac{1}{4}) = 0$ $(x-\frac{9}{4})(x+\frac{1}{4}) = 0 \rightarrow x = \frac{9}{4}, x = -\frac{1}{4}$ ب) $x^2 - 1x - 9 = 0 \rightarrow (x-9)(x+1) = 0$ $a=1 \rightarrow (x-9)(x+1) = 0 \rightarrow (x-4)(x+2) = 0$ $(x-4)(x+2) = 0 \rightarrow x = 4, x = -2$ ج) $a \cdot c = 4 \times (-3) = -12 \rightarrow x^2 - 4x - 12 = 0 \rightarrow (x-6)(x+2) = 0$ $(x-6)(x+2) = 0 \rightarrow x = 6, x = -2$ د) $a \cdot c = 2 \times (-12) = -24 \rightarrow (x-12)(x+2) = 0$ $(x-12)(x+2) = 0 \rightarrow x = 12, x = -2$	
الف) $(x-7)(x+2) = 0 \rightarrow x = 7, x = -2$ ب) $\Delta = 25 - 4(2)(4) = 25 - 16 = 9 \rightarrow x = \frac{-5 \pm 3}{2} \Rightarrow x_1 = -1, x_2 = -4$ ج) $\Delta = 25 - 4(1)(4) = 25 - 16 = 9 \rightarrow x = \frac{-5 \pm 3}{2} \Rightarrow x_1 = -1, x_2 = -4$ د) $\Delta = 16 - 4(4)(-2) = 16 + 32 = 48 \rightarrow x = \frac{-4 \pm \sqrt{48}}{4}$	۲
۱. $A \times B = \{(1,2), (1,4), (2,2), (2,3), (4,2), (4,4)\}$ ۲. $B \times B = \{(2,2), (2,3), (4,2), (4,4)\}$ ۳. $A \times B - B^2 = \{(1,2), (1,4)\} \Rightarrow$ پاسخ	۳
الف) $\Rightarrow m^2 = m + 2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow m = 2, m = -1$ $2m \rightarrow (2,4), (2,1) \rightarrow$ نقض می‌باشد ب) $m^2 = m + 2 \Rightarrow m = 2, m = -1 \Rightarrow (-1,4), (-1,1) \rightarrow$ هیچ دشاری برای m نیست $(2,1), (2,4) \rightarrow$ نقض می‌باشد	۴
۱ دردی: $a^2 = 4a - 2 \rightarrow a^2 - 4a + 2 = 0 \rightarrow a = 1, a = 3$ $a = 2 \rightarrow \{ (1,4), (1,1), (3,4), (3,1) \} = \{ (1,4), (3,1) \}$ $a = 1 \rightarrow \{ (1,1), (1,4), (3,1), (3,4) \}$	۵

(1) $x=1 \rightarrow x^2 = ax+b \Rightarrow (1)^2 = a(1) + b \Rightarrow a+b = \dots$ (2)-(1) $\downarrow$ (2) $x=2 \rightarrow ax+b = x^2 \Rightarrow a(2)+b = (2)^2 \Rightarrow 2a+b = 4$ $a+b = 0 \rightarrow b = -a \rightarrow x^2 - 1$ $a \times b = 1 \times (-1) = (-1) \rightarrow$ جواب	$a = 1$ 6
$2k - 2 = 6 - 2k$ $2k + 2k = 6 + 2 \rightarrow 4k = 8 \rightarrow k = \frac{8}{4} = 2$	7
الف) $x=1 \Rightarrow y^2 - 4y = (1)^2 - 4(1) + 3 \Rightarrow y^2 - 4y = 0 \Rightarrow y(y-4) = 0$ $y = \pm\sqrt{4}, y=0 \rightarrow$ سه جواب ب) $x=1 \quad 1+ y = 4 \Rightarrow y = 3 \Rightarrow y = 3, y = -3 \rightarrow$ دو جواب ج) $x=\pi \quad \cos \pi = -1 \quad y = \sqrt{1-(-1)} = \sqrt{2} \Rightarrow y = \sqrt{2}, y = -\sqrt{2}$ دو جواب د) $y^2 + (x+1)^2 = 0 \quad (x+1)^2 = 0 \Rightarrow x = -1 \quad D_f = \{-1\}$ سه جواب $y^2 = 0 \Rightarrow y = 0$	8
الف) $\sqrt{y} = -x^2 + 2x - 2 \Rightarrow y = (-x^2 + 2x - 2)^2$ $y_1 = (-x^2 + 2x - 2)^2$ $y_2 = (-x^2 + 2x - 2)^2$ $y_1 = y_2$ سه جواب ب) $y_1^2 + 2y_1 = 5x \quad y_2^2 + 2y_2 = 5x \quad y_1^2 + 2y_1 = y_2^2 + 2y_2$ $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) + 2(y_1 - y_2) = 0$ $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 2) = 0 \rightarrow y_1 - y_2 = 0 \Rightarrow y_1 = y_2$ سه جواب $\Delta = B^2 - 4AC = (4r)^2 - 4(1)(4r^2 + 2) \Rightarrow -4y_2^2 - 8$	9
الف) $x=0 \Rightarrow x \sin y = y \sin(0) \Rightarrow 0 = 0$ برای $x=0$ هر مقدار y در برقرار است ب) $x, y > 0 \quad x, y \Rightarrow$ همبستگی $t = \sqrt{\frac{x}{y}} \Rightarrow t > 0 \quad t + \frac{1}{t} = 2 \rightarrow t^2 - 2t + 1 = 0 \Rightarrow (t-1)^2 = 0 \Rightarrow t = 1$ $\sqrt{\frac{x}{y}} = 1 \Rightarrow \frac{x}{y} = 1 \rightarrow x = y \Rightarrow$ سه جواب $-y_2 \pm \sqrt{-3y_2^2 - 8}$	10

برای $x=0$ هر مقدار y در برقرار است - هیچ مقدار x ندارد پس 9 سه جواب است -