

الف) $4n^2 - 5n - 4 = 0 \Rightarrow n^2 - 5n - 4 = 0 \Rightarrow (n-9)(n+4) = 0 \Rightarrow n = 9 \text{ یا } n = -4$
 ب) $3n^2 - 11n - 2 = 0 \Rightarrow n^2 - 11n - 2 = 0 \Rightarrow (n-9)(n+1) = 0 \Rightarrow n = 9 \text{ یا } n = -1$
 ج) $4n^2 - 11n - 2 = 0 \Rightarrow n^2 - 11n - 2 = 0 \Rightarrow (n-9)(n+1) = 0 \Rightarrow n = 9 \text{ یا } n = -1$
 د) $4n^2 - 5n - 4 = 0 \Rightarrow n^2 - 5n - 4 = 0 \Rightarrow (n-9)(n+4) = 0 \Rightarrow n = 9 \text{ یا } n = -4$

الف) $2x^2 - 5x - 12 = 0 \Rightarrow (x-7)(x+2) = 0 \Rightarrow x = 7 \text{ یا } x = -2$
 ب) $2x^2 + 5x + 3 = 0 \Rightarrow b = 5, a = 2, c = 3 \Rightarrow \Delta = 5^2 - 4(2)(3) = 25 - 24 = 1 > 0$
 ج) $2x^2 + 5x + 3 = 0 \Rightarrow \Delta = b^2 - 4ac = 25 - 24 = 1 > 0$
 د) $2x^2 + 5x + 3 = 0 \Rightarrow \Delta = 25 - 24 = 1 > 0$

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

الف) $m^2 = m + 2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow (m-2)(m+1) = 0 \Rightarrow m = 2 \text{ یا } m = -1$
 ب) $m^2 = m + 2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow (m-2)(m+1) = 0 \Rightarrow m = 2 \text{ یا } m = -1$

الف) $f(n) = \{(1, a^2), (1, 3a-2), (a^2, a+2)\}$
 ب) $a^2 = 3a - 2 \Rightarrow a^2 - 3a + 2 = 0 \Rightarrow (a-1)(a-2) = 0 \Rightarrow a = 1 \text{ یا } a = 2$

الف) $f(n) = \begin{cases} a^2 - 1 & n \leq 1 \\ a + b & 1 < n \leq 2 \\ n^2 & n \geq 2 \end{cases}$
 ب) $2a + b = 1$
 ج) $a + b = 0$
 د) $a = 1$

الف) $f(n) = \begin{cases} 2n-3 & n \geq k \\ f+3n & n \leq k \end{cases}$
 ب) $2k-3 = f-3k$
 ج) $a_k = \frac{1}{3}$

الف) $x^2 - 4y = 0 \Rightarrow y = \frac{x^2}{4}$
 ب) $|x| + |y| = 3$
 ج) $1 < x < 2$
 د) $y^2 + (1) + (2) + 1 = 0$

الف) $\sqrt{y_1} + m_1^2 = 2m_1 - 2$
 ب) $\frac{y_1^3 + y_2}{a} = m_1$
 ج) $y_1^2 = y_2^2$
 د) $y_1(2y_1 + 2) = y_2(2y_2 + 2)$

الف) $n \sin y = y \sin n \Rightarrow n = 0$
 ب) $\sqrt{\frac{n}{y}} + \sqrt{\frac{y}{n}} = 2$
 ج) $\sqrt{\frac{y}{y}} + \sqrt{\frac{y}{y}} = 2 \Rightarrow y = 2$

$$\text{ج-۴) } (m^2, m^2) \text{ و } (m^2, m+2) \leadsto m^2 = m+2 \leadsto m^2 - m - 2 = 0.$$

$$m=2 \rightarrow (2, 1) \text{ و } (2, 4) \times$$

$$m=-1 \rightarrow (-1, 4) (-1, 3) \times \quad \text{به ازای هیچ مقدار } m \text{ عبارت تانژنت!}$$

$$\text{ج-۹) } y''' + 2y = \sin x$$

$$\int y_1''' + 2y_1 = \sin x_1$$

$$x_1 = x_2 \rightarrow$$

$$y_1''' + 2y_1 = y_2''' + 2y_2$$

$$\int y_2''' + 2y_2 = \sin x_2$$

$$y_1''' - y_2''' + 2(y_1 - y_2) = 0 \leadsto (y_1 - y_2)''' + 2(y_1 - y_2) = 0$$

$$\text{I} \leadsto y_1 - y_2 = 0 \leadsto y_1 = y_2 \quad \text{این دو یک جواب هستند پس تانژنت برابرند}$$

$$\text{II} \leadsto y_1'' + y_1 y_2 + y_2'' + 2 = 0 \leadsto y_1 = \frac{-y_2 \pm \sqrt{y_2^2 - 4(y_2'' + 2)}}{2} \quad \times$$

$$\leadsto y_1 = y_2 \quad \text{تایید می شود!}$$