

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره کلاس بازنگری B

الف) $4x^2 - 5x - 9 = 0 \rightarrow x^2 - 5x - 9 = 0 \rightarrow (x+4)(x-9) = 0 \rightarrow \begin{cases} x_1 = -4 \\ x_2 = 9 \end{cases}$
 ب) $3x^2 - 8x - 9 = 0 \rightarrow x^2 - 8x - 9 = 0 \rightarrow (x+1)(x-9) = 0 \rightarrow \begin{cases} x_1 = -1 \\ x_2 = 9 \end{cases}$
 ج) $2x^2 - 7x - 12 = 0 \rightarrow x^2 - 7x - 12 = 0 \rightarrow (x+2)(x-9) = 0 \rightarrow \begin{cases} x_1 = -2 \\ x_2 = 9 \end{cases}$
 د) $2x^2 - 5x - 12 = 0 \rightarrow x^2 - 5x - 12 = 0 \rightarrow (x+3)(x-8) = 0 \rightarrow \begin{cases} x_1 = -3 \\ x_2 = 8 \end{cases}$

الف) $x^2 - 5x - 12 = 0 \rightarrow \Delta = 25 - 4(1)(-12) = 81 \rightarrow x = \frac{5 \pm \sqrt{81}}{2} \rightarrow \begin{cases} x_1 = 9 \\ x_2 = -2 \end{cases}$
 ب) $2x^2 + 5x + 3 = 0 \rightarrow x^2 + 5x + 9 = 0 \rightarrow (x+3)(x+2) = 0 \rightarrow \begin{cases} x_1 = -3 \\ x_2 = -2 \end{cases}$
 ج) $x^2 + 4x + 3 = 0 \rightarrow \Delta = 4 - 4(1)(3) = -8 \rightarrow \Delta < 0 \Rightarrow$ ریشه ندارد *
 د) $2x^2 + 3x - 2 = 0 \rightarrow \Delta = 9 - 4(2)(-2) = 33 \rightarrow x = \frac{-3 \pm \sqrt{33}}{4}$

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

الف) $f(x) = \{(1, m^2), (2, 1), (-3, m), (-1, m), (2, m+2), (m, 4)\}$ $m+2 = m^2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m+1)(m-2) = 0 \rightarrow \begin{cases} m = -1 \\ m = 2 \end{cases}$
 ب) $g(x) = \{(1, m^2), (2, 1), (m, 4), (3, m+2), (-2, m), (-1, 3)\}$
 $m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m+1)(m-2) = 0 \rightarrow \begin{cases} m = -1 \\ m = 2 \end{cases}$
 به ازای هر یک از مقادیر m در هر دو مجموعه A و B قرار می‌دهیم تا ببینیم چه می‌شود.

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

$3a - 2, a^2 \rightarrow a^2 - 3a + 2 = 0 \rightarrow (a-1)(a-2) = 0 \rightarrow \begin{cases} a = 1 \\ a = 2 \end{cases}$

$f(x) = \begin{cases} x^r - 1 & x \leq 1 \\ ax + b & 1 < x \leq 2 \\ x^r & x > 2 \end{cases} \quad \left. \begin{array}{l} x^r - 1 \xrightarrow{x \rightarrow 1} 1 - 1 = 0 \\ ax + b \xrightarrow{x \rightarrow 1} a + b = 0 \end{array} \right\} (a + b = 0)$ $\left. \begin{array}{l} x^r \xrightarrow{x \rightarrow 2} 2^r = 1 \\ ax + b \xrightarrow{x \rightarrow 2} 2a + b = 1 \end{array} \right\} \frac{2a + b = 1}{a = 1}$ $a + b = 0 \rightarrow b = -1 \quad \text{then } 1x - 1 \quad \text{then } ax + b = 1x - 1 = -x + 1$	6
$f(x) = \begin{cases} rx - r & x \geq K \\ r - rx & x \leq K \end{cases} \quad \left. \begin{array}{l} rx - r = f - rx \xrightarrow{x=K} rK - r = f - rK \\ -r = -2K \\ K = \frac{r}{2} \end{array} \right\}$	7
الف) $y^r - 4y = x^r - 2x + 3 \xrightarrow{x=y} y^r - y = 0 \Rightarrow y = 0 \Rightarrow x = 0$ تابع نیست ب) $x + y = 3 \xrightarrow{x=y} y = \pm 2 \Rightarrow x = \pm 2$ تابع نیست ج) $y = \sqrt{1 - \cos x} \xrightarrow{x=\pi} y = \sqrt{2} \Rightarrow y = \pm \sqrt{2} \Rightarrow x = \pm \sqrt{2}$ تابع نیست د) $y^r + x^r + 2x + 1 = 0 \rightarrow y^r + \left(\frac{x+1}{-1}\right)^r = 0 \rightarrow (-1, 0) \checkmark$ تابع است	8
الف) $\sqrt[3]{y} + x^r = 2x - 2 \Rightarrow x_1 = x_2 \Rightarrow \sqrt[3]{y_1} + x_1^r = 2x_1 - 2 = \sqrt[3]{y_2} + x_2^r = 2x_2 - 2$ $\Rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2} \Rightarrow y_1 = y_2 \checkmark$ تابع است ب) $y^r + 2y = 2x \xrightarrow{x_1=x_2} y_1^r + 2y_1 = y_2^r + 2y_2 \rightarrow y_1^r - y_2^r + 2(y_1 - y_2) = 0$ $(y_1 - y_2)(y_1^r + y_1 y_2 + y_2^r) + 2(y_1 - y_2) = 0 \rightarrow (y_1 - y_2)(y_1^r + y_1 y_2 + y_2^r + 2) = 0$ $y_1^r + y_1 y_2 + y_2^r = \frac{1}{r} [(y_1 + y_2)^r - y_1^r - y_2^r] \geq 0 \quad y_1^r + y_1 y_2 + y_2^r + 2 > 0 \rightarrow y_1 - y_2 = 0 \Rightarrow y_1 = y_2 \checkmark$ تابع است	9
الف) $x \sin y, y \sin x \xrightarrow{x=y} x = y \sin x \rightarrow 0 = 0$ تابع است ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \rightarrow t = \sqrt{\frac{x}{y}} \rightarrow t + \frac{1}{t} = 2 \rightarrow (t-1)^2 = 0$ $t = 1 \rightarrow \frac{x}{y} = 1 \Rightarrow x = y \quad (x \neq 0) \checkmark$ تابع است	10