

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره کلاس تاریخ ۱۳۹۸

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الف) $4x^2 - 4x - 4 = 0 \rightarrow x^2 - x - 1 = 0 \rightarrow (x-1)(x+1) = 0 \rightarrow \begin{cases} x_1 = 1 \\ x_2 = -1 \end{cases}$

ب) $x^2 - 18x - 9 = 0 \rightarrow x^2 - 18x - 9 = 0 \rightarrow (x-9)(x+1) = 0 \rightarrow \begin{cases} x_1 = 9 \\ x_2 = -1 \end{cases}$

ج) $x^2 - 8x - 12 = 0 \rightarrow x^2 - 8x - 12 = 0 \rightarrow (x-4)(x+3) = 0 \rightarrow \begin{cases} x_1 = 4 \\ x_2 = -3 \end{cases}$

د) $x^2 - 5x - 12 = 0 \rightarrow x^2 - 5x - 12 = 0 \rightarrow (x-8)(x+3) = 0 \rightarrow \begin{cases} x_1 = 8 \\ x_2 = -3 \end{cases}$

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الف) $x^2 - 5x - 12 = 0 \rightarrow (x-8)(x+3) = 0 \rightarrow x = 8 \vee -3$

ب) $x^2 + 5x + 3 = 0 \rightarrow x^2 + 5x + 4 = 0 \rightarrow (x+1)(x+4) = 0 \rightarrow \begin{cases} x_1 = -1 \\ x_2 = -4 \end{cases}$

ج) $x^2 + 2x + 3 = 0 \rightarrow \Delta = b^2 - 4ac \rightarrow 4 - 12 = -8 < 0$ (ریشه حقیقی ندارد)

د) $x^2 + 3x - 2 = 0 \rightarrow \Delta = b^2 - 4ac = 9 + 8 = 17 \rightarrow x = \frac{-3 \pm \sqrt{17}}{2}$

$x_1 = \frac{-3 + \sqrt{17}}{2}$ و $x_2 = \frac{-3 - \sqrt{17}}{2}$

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$B^c = B \times B \rightarrow \{(1,2), (1,3), (2,2), (2,3)\}$

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

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

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

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

ج) $m = -1 \rightarrow g(x) = \{(1,1), (2,1), (3,1), (4,1), (5,1), (6,1), (7,1), (8,1), (9,1), (10,1), (11,1), (12,1), (13,1), (14,1), (15,1), (16,1), (17,1), (18,1), (19,1), (20,1), (21,1), (22,1), (23,1), (24,1), (25,1), (26,1), (27,1), (28,1), (29,1), (30,1), (31,1), (32,1), (33,1), (34,1), (35,1), (36,1), (37,1), (38,1), (39,1), (40,1), (41,1), (42,1), (43,1), (44,1), (45,1), (46,1), (47,1), (48,1), (49,1), (50,1), (51,1), (52,1), (53,1), (54,1), (55,1), (56,1), (57,1), (58,1), (59,1), (60,1), (61,1), (62,1), (63,1), (64,1), (65,1), (66,1), (67,1), (68,1), (69,1), (70,1), (71,1), (72,1), (73,1), (74,1), (75,1), (76,1), (77,1), (78,1), (79,1), (80,1), (81,1), (82,1), (83,1), (84,1), (85,1), (86,1), (87,1), (88,1), (89,1), (90,1), (91,1), (92,1), (93,1), (94,1), (95,1), (96,1), (97,1), (98,1), (99,1), (100,1)\}$

د) $m = 2 \rightarrow g(x) = \{(1,2), (2,2), (3,2), (4,2), (5,2), (6,2), (7,2), (8,2), (9,2), (10,2), (11,2), (12,2), (13,2), (14,2), (15,2), (16,2), (17,2), (18,2), (19,2), (20,2), (21,2), (22,2), (23,2), (24,2), (25,2), (26,2), (27,2), (28,2), (29,2), (30,2), (31,2), (32,2), (33,2), (34,2), (35,2), (36,2), (37,2), (38,2), (39,2), (40,2), (41,2), (42,2), (43,2), (44,2), (45,2), (46,2), (47,2), (48,2), (49,2), (50,2), (51,2), (52,2), (53,2), (54,2), (55,2), (56,2), (57,2), (58,2), (59,2), (60,2), (61,2), (62,2), (63,2), (64,2), (65,2), (66,2), (67,2), (68,2), (69,2), (70,2), (71,2), (72,2), (73,2), (74,2), (75,2), (76,2), (77,2), (78,2), (79,2), (80,2), (81,2), (82,2), (83,2), (84,2), (85,2), (86,2), (87,2), (88,2), (89,2), (90,2), (91,2), (92,2), (93,2), (94,2), (95,2), (96,2), (97,2), (98,2), (99,2), (100,2)\}$

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

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

اگر $a = 1 \rightarrow f(x) = \{(1,1), (1,2), (1,4)\} \rightarrow$ تابع ثابت

اگر $a = 2 \rightarrow f(x) = \{(1,4), (1,8), (4,10)\} \rightarrow$ تابع هسکل

$f(x) = \begin{cases} x^r - 1 & x \leq 1 \\ ax + b & 1 \leq x \leq r \\ x^r & x \geq r \end{cases}$	$\begin{aligned} x=1 &\rightarrow x^r - 1 = ax + b \rightarrow a + b = 0 \rightarrow a = -b \\ x=r &\rightarrow ax + b = x^r \rightarrow ra + b = \Lambda \\ -rb + b &= \Lambda \rightarrow -b = \Lambda \rightarrow b = \Lambda \\ ab &= -4\epsilon / \quad a = -\Lambda \end{aligned}$	6
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$f(x) = \begin{cases} rx - r & x \geq k \\ \epsilon - rx & x \leq k \end{cases}$	$\begin{aligned} \Rightarrow \text{I } rx - r &= \epsilon - rx \rightarrow \Delta x = r \rightarrow x = \frac{r}{\Delta} \\ \text{II } x=k &\rightarrow k = \frac{r}{\Delta} \end{aligned}$	7
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الف) $y^3 - 4y = x^2 - 2x + 3 \rightarrow y^3 - y = \dots \rightarrow x$ تابع نیست ب) $x + y = 3 \rightarrow x=0 \rightarrow y=3$ تابع نیست $y = -3 \rightarrow x$ تابع نیست ج) $y = \sqrt{1 - \cos x} = \cos \frac{x}{2} = 1$ تابع نیست $y = \sqrt{r} \rightarrow y = \pm \sqrt{r}$ تابع نیست د) $y^2 + x^2 + 2x + 1 = 0 \rightarrow x = -1 \rightarrow y = 0$ تابع نیست	8
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الف) $\sqrt[3]{y} + x^2 = rx - 1$ $\sqrt[3]{y_1} = -x_1^2 + rx_1 - 2$ $\sqrt[3]{y_2} = -x_2^2 + rx_2 - 2$ $\rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2} \rightarrow y_1 = y_2$ تابع است ب) $y^3 + xy = \Delta x$ $y_1^3 + xy_1 = \Delta x_1$ $y_2^3 + xy_2 = \Delta x_2$ $\rightarrow y_1^3 - y_2^3 + xy_1 - xy_2 = \Delta x_1 - \Delta x_2$ $\rightarrow (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2) + x(y_1 - y_2) = (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 + x)$ $\rightarrow (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 + x) = 0$ $\rightarrow y_1 = y_2$ تابع است	9
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الف) $x \sin y = y \sin x$ $\begin{cases} x=0 \\ 0 = y \sin 0 \rightarrow 0=0 \end{cases}$ تابع نیست ب) $\sqrt{\frac{y}{x}} = t \mid \sqrt{\frac{y}{x}} = \frac{1}{t} \rightarrow t + \frac{1}{t} = 2 \rightarrow t^2 + 1 = 2t \rightarrow t^2 + 1 - 2t = 0$ $(t-1)^2 = 0 \rightarrow t=1 \Rightarrow \sqrt{\frac{y}{x}} = 1 \rightarrow \frac{y}{x} = 1 \rightarrow y = x$ $\begin{cases} x \neq 0 \\ y \neq 0 \end{cases}$ تابع است	10
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