

Date: .....

۲. افین

لیت (نوری) ریاضی (A)

الف)  $4x^2 - 5x - 4 = 0 \rightarrow x^2 - 5x - 12 = 0 \rightarrow (x-9)(x+4) = 0 \rightarrow x_1 = 9, x_2 = -4$

ب)  $3x^2 - 8x - 3 = 0 \rightarrow x^2 - 8x - 9 = 0 \rightarrow (x-9)(x+1) = 0 \rightarrow x_1 = 9, x_2 = -1$

ج)  $4x^2 - 4x - 3 = 0 \rightarrow x^2 - 4x - 12 = 0 \rightarrow (x-6)(x+2) = 0 \rightarrow x_1 = 6, x_2 = -2$

د)  $2x^2 - 5x - 12 = 0 \rightarrow x^2 - 5x - 24 = 0 \rightarrow (x-8)(x+3) = 0 \rightarrow x_1 = 8, x_2 = -3$

الف)  $x^2 - 5x - 14 = 0 \rightarrow (x-7)(x+2) = 0 \rightarrow x_1 = 7, x_2 = -2$

ب)  $2x^2 + 5x + 3 = 0 \rightarrow x = -1, x = -\frac{3}{2}$

ج)  $x^2 + 2x + 3 = 0 \rightarrow \Delta, 4 - 12 < 0$  ریشه ندارد

د)  $3x^2 + 3x - 2 = 0 \rightarrow \Delta, 9 + 24 = 33 \rightarrow x = \frac{-3 \pm \sqrt{33}}{6} \rightarrow x_1 = \frac{-3 - \sqrt{33}}{6}, x_2 = \frac{-3 + \sqrt{33}}{6}$

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

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الف)  $f(x) = \{(3, m^2)(2, 1)(-3, m)(-2, m)(3, m+2)(m, 4)\}$  - 4

$m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m-2)(m+1) = 0$    
 $\rightarrow m=2$  تحقق  $\{(2, 1)(2, 4)\}$    
 $\rightarrow m=-1$  ✓ ✓

ب)  $g(x) = \{(3, m^2)(2, 1)(m, 4)(3, m+2)(-2, m)(-1, 3)\}$  هیچ مقدار ✓

$m^2 - m - 2 = 0 \rightarrow (m-2)(m+1) = 0$    
 $\rightarrow m=2$  تحقق  $\{(2, 1)(2, 4)\}$    
 $\rightarrow m=-1$  تحقق  $\{(-1, 3)(-1, 4)\}$

$f(x) = \{(1, a^2)(1, 3a-2)(a^2, 3a+2)\} \rightarrow a^2 - 3a + 2 = 0$  - 5   
 $(a-2)(a-1) = 0 \rightarrow a=2$  ✓   
 $\rightarrow a=1$  تحقق

اگر  $x=1 \rightarrow 1-1 = a+b \rightarrow a+b=0 \rightarrow a=-b$  - 6

اگر  $x=2 \rightarrow 2a+b = 1 \rightarrow 2a-a=1 \rightarrow a=1 \quad b=-1$    
 $ab = -1$  ✓

$2k-3 = 4-3k \rightarrow 5k=7 \rightarrow k=\frac{7}{5}$  ✓

الف)  $y^5 - y^3 \Rightarrow$  تابع نسیب   
 مثال:  $x=0 \rightarrow y=0$

ب)  $|x| + |y| = 3 \xrightarrow{x=0} |y| = 3 \rightarrow y = \pm 3$  تابع نسیب ✓

ج)  $|y| = \sqrt{1-\cos x} \xrightarrow{\cos x=0} |y| = 1 \rightarrow y = \pm 1$  تابع نسیب ✓

د)  $(x+1)^2 + y^2 = 0 \rightarrow x=-1 \text{ و } y=0$  ✓   
 تابع است

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الف)  $\sqrt{y} + x^2 = 2x - 2 \rightarrow \sqrt{y_1} = (-x_1^2 + 2x_1 - 2)^2$   
 $(x-1)^2 = -(\sqrt{y}, 1) \rightarrow (x-1)\sqrt{y_2} = -x_1^2 + 2x_1 - 2$   
 $x_1 = x_2 \Rightarrow \sqrt{y_1} = \sqrt{y_2} \Rightarrow y_1 = y_2$   
 تابع است

ب)  $y^3 + 2y = 5x \rightarrow 5x = y_1^3 + 2y_1 \rightarrow y_1^3 + 2y_1 = y_2^3 + 2y_2$   
 $5x = y_2^3 + 2y_2$

$y_1^3 - y_2^3 + 2y_1 - 2y_2 = 0 \rightarrow (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2) + 2(y_1 - y_2) = 0$   
 $= (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 + 2) \neq 0$   
 $y_1 - y_2 = 0 \rightarrow y_1 = y_2$   
 تابع است

الف)  $x \sin y = y \sin x \rightarrow \text{if } x=0 \Rightarrow 0 = y \sin 0 \Rightarrow 0=0$   
 تابع نیست  $\Rightarrow$  بیجهت

$\rightarrow \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \rightarrow \sqrt{\frac{x}{y}} = A \Rightarrow A + \frac{1}{A} = 2 \rightarrow A^2 - 2A + 1 = 0 \rightarrow (A-1)^2 = 0$

$\rightarrow A=1 \rightarrow \sqrt{\frac{x}{y}} = 1 \rightarrow x=y$   
 سرچا  $x=y \neq 0$  یا  $x=y=0$

ب)  $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$

این عبارت تنها زمانی برقرار است که  $\sqrt{\frac{x}{y}} = 1$  باشد پس

$\sqrt{\frac{x}{y}} = 1 \Rightarrow \frac{x}{y} = 1 \Rightarrow x=y$  و  $(x, y \neq 0)$

