

۲. آفرین خیر عالی نوشتار!

بازدهم سر B

مدی جان ندی

سوال ۱-

$$\text{الف)} 4x^2 - 5x - 4 = 0 \rightarrow x^2 - 5x - 4 = 0 \rightarrow (x-9)(x+4) = 0$$

$$\rightarrow x \begin{cases} \rightarrow \frac{9}{4} = \frac{9}{4} \\ \rightarrow -\frac{4}{4} = -\frac{4}{4} \end{cases}$$

$$\text{ب)} x^2 - 1x - 9 = 0 \rightarrow (x-9)(x+1) = 0 \Rightarrow x \begin{cases} \rightarrow \frac{9}{1} = 9 \\ \rightarrow -\frac{1}{1} = -1 \end{cases}$$

$$\text{ج)} 4x^2 - 4x - 2 = 0 \Rightarrow x^2 - x - 12 = 0 \Rightarrow (x-4)(x+3) = 0 \Rightarrow x \begin{cases} \rightarrow \frac{4}{1} = 4 \\ \rightarrow -\frac{1}{1} = -1 \end{cases}$$

$$\text{د)} 2x^2 - 5x - 12 = 0 \Rightarrow x^2 - 5x - 24 = 0 \Rightarrow (x-8)(x+3) = 0 \Rightarrow x \begin{cases} \rightarrow \frac{8}{1} = 8 \\ \rightarrow -\frac{3}{1} = -3 \end{cases}$$

$$\text{الف)} x^2 - 5x - 14 = 0 \Rightarrow (x-7)(x+2) = 0 \Rightarrow x \begin{cases} \rightarrow \frac{7}{1} = 7 \\ \rightarrow -\frac{2}{1} = -2 \end{cases}$$

سوال ۲:

$$\text{ب)} 2x^2 + 5x + 2 = 0 \Rightarrow a+c=b \rightarrow x \begin{cases} \rightarrow \frac{-1}{2} = -\frac{1}{2} \\ \rightarrow -\frac{2}{1} = -2 \end{cases}$$

$$\text{ج)} x^2 + 2x + 2 = 0 \Rightarrow \Delta = b^2 - 4ac \rightarrow 4 - 12 = -8 \rightarrow \Delta < 0 \rightarrow \text{ریشه حقیقی ندارد}$$

$$\text{د)} 2x^2 + 2x - 2 = 0 \Rightarrow \Delta = b^2 - 4ac \quad x = \frac{-2 \pm \sqrt{2^2 - 4(2)(-2)}}{4}, \quad x = \frac{-2 \pm \sqrt{20}}{4}$$

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

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

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

$$\Rightarrow m = \begin{cases} \rightarrow 2 \\ \rightarrow -1 \end{cases} \Rightarrow m = -1$$

$$\text{ب)} \Rightarrow m^2 = m + 2 \Rightarrow \begin{cases} \rightarrow \frac{2}{-1} = -2 \\ \rightarrow -\frac{1}{1} = -1 \end{cases} \Rightarrow m = -1$$

سوال ۵:

$$a^2 = 3a - 2 \Rightarrow a^2 - 3a + 2 = 0 \Rightarrow a \begin{cases} \rightarrow \frac{2}{1} = 2 \\ \rightarrow -\frac{1}{1} = -1 \end{cases} \Rightarrow a = 2$$

$$x=1 \rightarrow x^2 - 1 = ax + b \Rightarrow a + b = 0 \Rightarrow b = -a$$

$$x=2 \rightarrow x^2 = ax + b \Rightarrow 4 = 2a + b \Rightarrow a = 1, b = -1$$

$$ab = -1 \times 1 = -1$$

سوال ۶:

سوال ۷: $\left. \begin{matrix} 2x-3 & x \geq k \\ x-2x & x \geq k \end{matrix} \right\} 2k-3 = 4-3k \Rightarrow \Delta k = 7 \rightarrow k = \frac{7}{\Delta}$

سوال ۸: الف) $y^3 - 4y = x^2 - 4x + 3 \xrightarrow{x=-1} y^3(y-4) = 0 \rightarrow \begin{cases} y=0 \\ y=4 \end{cases}$
 $\rightarrow |x| + |y| = 3 \xrightarrow{x=1} y = \pm 2 \rightarrow$ تابع نیست

ج) $|y| = \sqrt{1 - \cos x} \xrightarrow{x=180^\circ} y = \pm 1 \rightarrow$ تابع نیست

د) $-y^2 = x^2 + 2x + 1 \rightarrow (x+1)^2 \rightarrow (-1, 0)$ تابع هست

سوال ۹: الف) $\sqrt[3]{y} + x^2 = 2x - 2 \rightarrow \sqrt[3]{y} = -x^2 + 2x - 2$

$\Rightarrow \left. \begin{matrix} \sqrt[3]{y_1} = x_1^2 + 2x_1 - 2 \\ \sqrt[3]{y_2} = -x_2^2 + 2x_2 - 2 \end{matrix} \right\} \rightarrow x_1 = x_2 \rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2}$

OR $y_1 = y_2$ تابع هست

ب) $y^2 + 2y = \Delta x \quad \begin{matrix} y_1^2 + 2y_1 = \Delta x_1 \\ y_2^2 + 2y_2 = \Delta x_2 \end{matrix} \xrightarrow{x_1=x_2} y_1^2 + 2y_1 = y_2^2 + 2y_2$

$y_1^2 - y_2^2 + 2y_1 - 2y_2 = 0 \rightarrow (y_1 - y_2)(y_1 + y_2 + 2) + 2(y_1 - y_2) = 0$

$\rightarrow \underbrace{(y_1 - y_2)}_{y_1=y_2} \underbrace{(y_1 + y_2 + 2)}_{\text{عبارت +}} \rightarrow y_1 = y_2$ تابع هست

سوال ۱۰: الف) $x \sin y = y \sin x \xrightarrow{x=0} 0 \times \sin y = y \times 0 \quad R=y$

تابع نیست

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \xrightarrow{\text{توان ۲}} \frac{x}{y} + 2 + \frac{y}{x} = 4 \Rightarrow \frac{x^2 + y^2}{xy} - 2 = 0$

$x^2 + y^2 - 2xy = 0 \rightarrow (x-y)^2 = 0 \Rightarrow x = y$ (مقتضای افتاق) 

$$(10-ب) \quad \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$$

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

$$\sqrt{\frac{x}{y}} = 1 \leadsto \frac{x}{y} = 1 \leadsto x = y \quad (x, y \neq 0)$$

