

بارهم دختر

تالیف ! " ۲۰ آفرین

محاسبه

الف) $4x^2 - 5x - 4 = 0 \rightarrow x^2 - 5x - 4 = 0 \rightarrow (x-9)(x+4) = 0 \Rightarrow x = 9$
 $\frac{9}{4} = \frac{10}{4} = 1,25$
 $\frac{-4}{4} = \frac{-1}{1} = -0,25$

ب) $10x^2 - 11x - 1 = 0 \rightarrow x^2 - 11x - 1 = 0 \rightarrow (x-9)(x+1) = 0 \Rightarrow x = 9$
 $\frac{9}{10} = \frac{10}{10} = 1$
 $\frac{-1}{10} = \frac{-1}{10} = -0,1$

ج) $14x^2 - 14x - 1 = 0 \rightarrow x^2 - 14x - 1 = 0 \rightarrow (x-4)(x+2) = 0 \Rightarrow x = 4$
 $\frac{4}{14} = \frac{10}{14} = 1,0$
 $\frac{-1}{14} = \frac{-1}{14} = -0,07$

د) $17x^2 - 17x - 1 = 0 \rightarrow x^2 - 17x - 1 = 0 \rightarrow (x-1)(x+13) = 0 \Rightarrow x = 1$
 $\frac{1}{17} = \frac{1}{17}$
 $\frac{-1}{17} = \frac{-1}{17} = -0,05$

الف) $(x-7)(x+2) = 0 \Rightarrow x = 7$
 $\frac{7}{7} = 1$
 $\frac{-2}{7} = -0,28$

ب) $12x^2 + 12x + 1 = 0 \rightarrow x^2 + 12x + 1 = 0 \rightarrow (x+7)(x+13) = 0 \Rightarrow x = -7$
 $\frac{-7}{12} = -0,58$
 $\frac{1}{12} = 0,08$

ج) $x^2 + 12x + 1 = 0 \rightarrow \Delta = b^2 - 4ac \Rightarrow \Delta = 144 - 4 = 140 \Rightarrow \Delta > 0 \Rightarrow$ فاصله

د) $13x^2 + 13x - 1 = 0 \rightarrow \Delta = b^2 - 4ac \Rightarrow \Delta = 169 + 4 = 173 \Rightarrow x = \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow x = \frac{-13 \pm \sqrt{173}}{26}$

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

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

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

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

الف) $a = 1 \rightarrow \{ (1,1) (1,1) (1,5) \}$
 $a = 2 \rightarrow \{ (1,4) (1,4) (4,8) \}$

$f(m) = \begin{cases} m^2 - 1 & m \leq 1 \\ a + b & 1 \leq m \leq 2 \\ m^2 & m \geq 2 \end{cases}$
 $m = 1 \Rightarrow 1 - 1 = a + b \Rightarrow a + b = 0 \Rightarrow b = -a$
 $m = 2 \Rightarrow 4 = 2a + b \Rightarrow 4 = 2a - a \Rightarrow a = 4 \Rightarrow b = -4$
 $ab = 4 \times -4 = -16$

$$f(n) = \begin{cases} 2n-1 & n \geq k \\ 1-2n & n \leq k \end{cases} \quad \begin{matrix} n=k \\ \omega k = 1 \end{matrix} \quad \begin{matrix} 2k-1 = 1-2k \\ \omega k = 1 \end{matrix} \quad \boxed{k = \frac{1}{\omega}} = 1$$

الف) $y^3 - 4y = n^3 - 4n + 1 \rightarrow y_1^3 - 4y_1 = n_1^3 - 4n_1 + 1$
 $y_2^3 - 4y_2 = n_2^3 - 4n_2 + 1$
 $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 - 4) = 0$
 $\rightarrow y_1 = y_2$
 $\Delta = y_1^2 - 4(y_1 - 4) = y_1^2 - 4y_1 + 16$
 $\Delta > 0 \Rightarrow -16y_1^2 + 16 \leq 0$

ب) $|m| + |y| = 1 \xrightarrow{n=0} |y| = 1 \Rightarrow y = \pm 1$

ج) $|y| = \sqrt{1 - \cos n} \rightarrow 1 - \cos n \geq 0 \rightarrow 1 \geq \cos n \rightarrow \cos n = 0 \Rightarrow |y| = \sqrt{1-0} \Rightarrow |y| = 1$
 $\rightarrow y = \pm 1$

د) $y^2 + (n+1)^2 = 0 \rightarrow y = 0, n = -1$

الف) $\sqrt[3]{y_1} = -n_1^2 + 1, n_1 = 1 \rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2} \Rightarrow y_1 = y_2$

ب) $y_1^3 + 2y_1 = n^3 \rightarrow y_1^3 + 2y_1 = y_2^3 + 2y_2 \rightarrow y_1^3 - y_2^3 = 2y_2 - 2y_1$
 $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) + 2(y_1 - y_2) = 0$
 $(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + 2) = 0 \Rightarrow y_1 = y_2$

$\Delta = y_1^2 - 4(y_1 + 2)$
 $\Delta = y_1^2 - 4y_1 - 8 \rightarrow \Delta < 0 \Rightarrow$

الف) $n \sin y = y \sin n \rightarrow n=0 \Rightarrow y=0$

ب) $\left(\sqrt{\frac{m}{y}} + \sqrt{\frac{y}{m}}\right)^2 = 4 \rightarrow \frac{m}{y} + \frac{y}{m} = 2 \rightarrow m^2 + y^2 - 2my = 0$
 $(m-y)^2 = 0 \rightarrow m, y \in \mathbb{R}$

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

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

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

