

الف) $x^2 - 5x - 6 = 0 \Rightarrow x^2 - 5x - 6 = 0 \Rightarrow (x-6)(x+1) = 0 \Rightarrow$

ب) $3x^2 - 11x - 3 = 0 \Rightarrow x^2 - 11x - 9 = 0 \Rightarrow (x-9)(x+1) = 0 \Rightarrow$

ج) $4x^2 - 4x - 3 = 0 \Rightarrow x^2 - 4x - 12 = 0 \Rightarrow (x-6)(x+2) = 0 \Rightarrow$

د) $2x^2 - 5x - 12 = 0 \Rightarrow x^2 - 5x - 12 = 0 \Rightarrow (x+3)(x-1) = 0 \Rightarrow$

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الف) $x^2 - 5x - 14 = 0 \Rightarrow (x-7)(x+2) = 0 \Rightarrow$

ب) $2x^2 + 5x + 3 = 0 \Rightarrow x = -1$

ج) $x^2 + 2x + 3 = 0 \Rightarrow x = \frac{-2 \pm \sqrt{4-12}}{2} = \frac{-2 \pm \sqrt{-8}}{2} = \frac{-2 \pm 2\sqrt{-2}}{2} = -1 \pm \sqrt{-2}$

د) $2x^2 + 3x - 2 = 0 \Rightarrow x = \frac{-3 \pm \sqrt{9-4(-2)}}{4} = \frac{-3 \pm \sqrt{17}}{4}$

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

$B^Y = \{(2,2), (2,3), (3,2), (3,3)\}$

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

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

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

ج) $h(x) = \{(3, 4), (2, 1), (2, 4), (3, 4), (-2, 1), (-1, 3)\} =$

د) $i(x) = \{(3, 4), (2, 1), (2, 4), (3, 4), (-2, 1), (-1, 3)\} =$

$f(x) = \{ \underbrace{(1, a^2)}_*, \underbrace{(1, 3a-2)}_*, (a^2, 3a+2) \} \Rightarrow * \Rightarrow a^2 = 3a-2 \Rightarrow a^2 - 3a + 2 = 0 \xrightarrow{a+b+c=0} \begin{cases} 1) a=+1 \\ 2) a=+2 \end{cases}$

$1) \Rightarrow \{ \underbrace{(1, 1)}_*, \underbrace{(1, 1)}_*, \underbrace{(1, 5)}_* \} \Rightarrow a=1 \quad 2) \Rightarrow \{ \underbrace{(1, 4)}_*, \underbrace{(1, 4)}_*, \underbrace{(4, 1)}_* \} \Rightarrow a=2$

$f(x) = \begin{cases} x^2-1 & x \leq 1 \\ ax+b & 1 < x < 2 \\ x^2 & x \geq 2 \end{cases} \Rightarrow \begin{cases} 1) x=1 \Rightarrow (1)^2-1 = a+b \Rightarrow a+b=0 \\ 2) x=2 \Rightarrow 2a+b = (2)^2 \Rightarrow 2a+b=4 \end{cases} \Rightarrow \begin{cases} a+b=0 \\ -b=4 \end{cases} \Rightarrow b=-4 \Rightarrow a=4$

$f(x) = \begin{cases} 2x-3 & x \geq K \\ x^2-3x & x < K \end{cases} \Rightarrow x=K \Rightarrow 2K-3 = K^2-3K \Rightarrow K^2-5K+3=0 \Rightarrow K = \frac{5 \pm \sqrt{13}}{2}$

الف) $y^3 - 2y = x^2 - 4x + 3 \Rightarrow \begin{cases} 1) y=3 \Rightarrow 3^3 - 2 \cdot 3 = 27 - 6 = 21 \\ 2) y=1 \Rightarrow 1^3 - 2 \cdot 1 = 1 - 2 = -1 \end{cases} \Rightarrow \begin{cases} 1) x=1 \Rightarrow y(y^2-2) = 1^2 - 2(1) + 3 = 2 \Rightarrow y=2 \\ 2) x=3 \Rightarrow y(y^2-2) = 3^2 - 2(3) + 3 = 6 \Rightarrow y=3 \end{cases}$

ب) $|x| + |y| = 3 \Rightarrow \begin{cases} y=3 \\ y=-3 \end{cases} \Rightarrow \begin{cases} 1) |y| = \sqrt{1-\cos x} \Rightarrow 1-\cos x = 0 \Rightarrow \cos x = 1 \Rightarrow x=0 \\ 2) x=\pi \Rightarrow |y| = \sqrt{1-\cos \pi} = \sqrt{1-(-1)} = \sqrt{2} \Rightarrow y = \pm \sqrt{2} \end{cases}$

ج) $|y| = \sqrt{1-\cos x} \Rightarrow \begin{cases} 1) \cos x = 1 \Rightarrow x=0 \\ 2) \cos x = -1 \Rightarrow x=\pi \end{cases}$

د) $y^2 + x^2 + 2x + 1 = 0 \Rightarrow y^2 + (x+1)^2 = 0 \Rightarrow y=0, x=-1$

الف) $\sqrt[3]{y+x} = 2x-2 \Rightarrow \begin{cases} \sqrt[3]{y_1+x_1} = -x_1^2+2x_1-2 \\ \sqrt[3]{y_2+x_2} = -x_2^2+2x_2-2 \end{cases} \Rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2} \Rightarrow y_1=y_2$

ب) $y^3 + 2y = 5x \Rightarrow \begin{cases} y_1^3 + 2y_1 = 5x \\ y_2^3 + 2y_2 = 5x \end{cases} \Rightarrow y_1^3 + 2y_1 = y_2^3 + 2y_2 \Rightarrow y_1^3 - y_2^3 + 2y_1 - 2y_2 = 0 \Rightarrow (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 + 2) = 0$

$\Rightarrow (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 + 2) = 0$

1) $y_1 = y_2$

2) $y_1 = \frac{-y_2 \pm \sqrt{y_2^2 - 4(y_2^2 + 2)}}{2} = \frac{-y_2 \pm \sqrt{-3y_2^2 - 8}}{2}$

الف) $x \sin y = y \sin x \xrightarrow{x=y} x \sin x = x \sin x$

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

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \Rightarrow \frac{x}{y} + \frac{y}{x} = 2 \Rightarrow \frac{x^2 + y^2}{xy} = 2 \Rightarrow x^2 + y^2 = 2xy \Rightarrow (x-y)^2 = 0 \Rightarrow x=y$

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

اسی عبارت تنہا زمانی برقرار است کہ $1 = \sqrt{\frac{x}{y}}$ بالذکر ہے

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

