

لیکھ (نورنی ریاضیہ A)

الف) $4x^2 - 5x - 4 = 0 \rightarrow x^2 - 5x - 16 = 0 \rightarrow (x-9)(x+4) = 0 \rightarrow x_1 = \frac{3}{4}$
 $\rightarrow x_2 = -\frac{4}{3}$

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

ج) $4x^2 - 4x - 3 = 0 \rightarrow x^2 - 4x - 12 = 0 \rightarrow (x-6)(x+2) = 0 \rightarrow x_1 = \frac{4}{3}$
 $\rightarrow x_2 = -\frac{1}{4}$

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

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

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

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

د) $3x^2 + 3x - 2 = 0 \rightarrow \Delta, 9 + 24 = 33 \rightarrow x = \frac{-3 \pm \sqrt{33}}{4}$
 $x = \frac{-3 - \sqrt{33}}{4}$
 $x = \frac{-3 + \sqrt{33}}{4}$

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

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

$$m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m-2)(m+1) = 0 \rightarrow \begin{cases} m=2 \text{ تحقق } \{(2, 1)(2, 4)\} \\ m=-1 \end{cases}$$

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

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

د) $f(x) = \{(1, a^2)(1, 3a-2)(a^2, 3a+2)\} \rightarrow a^2 - 3a + 2 = 0$ - 5
 $(a-2)(a-1) = 0 \rightarrow \begin{cases} a=2 \checkmark \\ a=1 \text{ تحقق} \end{cases}$

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

ب) $x=2 \rightarrow 2a+b=1 \rightarrow 2a-a=1 \rightarrow \boxed{a=1} \quad \boxed{b=-1} \quad \boxed{ab=-1}$ - 7

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

الف) $y^5 - y^3 \Rightarrow$ تابع نسیب

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

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

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

$$\text{الف) } \sqrt{y} + x^2 = 2x - 2 \rightarrow \sqrt{y_1} = (-x_1^2 + 2x_1 - 2)^2$$

$$(x-1)^2 = -(\sqrt{y_1}) \rightarrow (x-1)\sqrt{y_2} = -x_1^2 + 2x_1 - 2$$

$$\begin{aligned} x_1 &= x_2 \Rightarrow \sqrt{y_1} = \sqrt{y_2} \\ &\Rightarrow y_1 = y_2 \\ &\text{تابع است} \end{aligned}$$

$$\text{ب) } y^3 + 2y = 5x \rightarrow \begin{aligned} 5x &= y_1^3 + 2y_1 \\ 5x &= y_2^3 + 2y_2 \end{aligned} \rightarrow y_1^3 + 2y_1 = y_2^3 + 2y_2$$

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

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

$$y_1 - y_2 = 0$$

$$\boxed{y_1 = y_2}$$

✓✓

ریشه ندارد

تابع است

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

تابع منتهی به بی‌نهایت

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

$$\rightarrow A=1 \rightarrow \sqrt{\frac{x}{y}} = 1 \rightarrow \boxed{x=y} \quad \checkmark \checkmark$$