

$$1) 6x^2 - 5x - 6 = 0 \Rightarrow x^2 - 5x - 24 = 0 \Rightarrow (x-9)(x+3) = 0 \rightarrow \begin{cases} x=9 \Rightarrow \frac{3}{2} \\ x=-3 \Rightarrow \frac{-2}{3} \end{cases}$$

$$ب) 15x^2 - 11x - 2 = 0 \Rightarrow x^2 - 11x - 9 = 0 \Rightarrow (x-9)(x+1) = 0 \rightarrow \begin{cases} x=9 \Rightarrow \frac{3}{4} \\ x=-1 \Rightarrow \frac{-1}{4} \end{cases}$$

$$ج) 4x^2 - 4x - 3 = 0 \Rightarrow x^2 - 4x - 12 = 0 \Rightarrow (x-6)(x+2) = 0 \rightarrow \begin{cases} x=6 \Rightarrow \frac{3}{2} \\ x=-2 \Rightarrow \frac{-1}{2} \end{cases}$$

$$د) 2x^2 - 5x - 12 = 0 \Rightarrow x^2 - 5x - 24 = 0 \Rightarrow (x-9)(x+3) = 0 \rightarrow \begin{cases} x=9 \Rightarrow \frac{3}{2} \\ x=-3 \Rightarrow \frac{-3}{2} \end{cases}$$

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

$$ب) 2x^2 + 5x + 3 = 0 \Rightarrow x^2 + 5x + 6 = 0 \Rightarrow (x+3)(x+2) = 0 \rightarrow \begin{cases} x=-3 \Rightarrow \frac{-3}{2} \\ x=-2 \Rightarrow -1 \end{cases}$$

$$ج) x^2 + 4x + 3 = 0 \Rightarrow \Delta = b^2 - 4ac = 16 - 12 = 4 \Rightarrow \sqrt{\Delta} = 2 \Rightarrow x = \frac{-4 \pm 2}{2} \Rightarrow \begin{cases} x = -1 \\ x = -3 \end{cases}$$

$$د) 3x^2 + 3x - 2 = 0 \Rightarrow \Delta = 9 - 4(3)(-2) = 9 + 24 = 33 \Rightarrow \sqrt{\Delta} = \sqrt{33} \Rightarrow x = \frac{-3 \pm \sqrt{33}}{6} \Rightarrow \begin{cases} x = \frac{-3 + \sqrt{33}}{6} \\ x = \frac{-3 - \sqrt{33}}{6} \end{cases}$$

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

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

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

$$m^2 = m+2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow (m-2)(m+1) = 0 \rightarrow \begin{cases} m=2 \\ m=-1 \end{cases}$$

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

$$m^2 = m+2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow (m-2)(m+1) = 0 \rightarrow \begin{cases} m=2 \\ m=-1 \end{cases}$$

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

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

$$4) f(n) = \begin{cases} n^2 - 1 & n < 1 \\ an + b & 1 \leq n \leq 2 \\ n^2 & n > 2 \end{cases} \rightarrow a+b=0 \quad \begin{cases} 2a+b=1 \\ a+b=0 \end{cases}$$

$$a=1 \quad b=-1$$

$$a \times b = 1 \times -1 = -1$$

$$5) f(n) = \begin{cases} 2n-3 & n \geq K \\ K-2n & n < K \end{cases} \quad 2K-3 = f-3K$$

$$\Delta K = \sqrt{\frac{9}{4}}$$

$$K = \frac{3}{2}$$

$$6) \text{ الف) } y'' - 4y = n^2 - 2n + 3 \Rightarrow n=0$$

$$y'' - y \rightarrow \text{تابع سین}$$

$$\text{ب) } |n| + |y| = +3$$

$$n=0 \Rightarrow y = \pm 3 \text{ تابع سین}$$

$$\text{ج) } |y| = \sqrt{1 - \cos x}$$

$$n=0$$

$$|y| = 1$$

$$y = \pm 1 \text{ تابع سین}$$

$$\Rightarrow y_1^2 + 2y_1 + 1 = 0$$

$$y_1^2 + (n+1)^2 = 0 \quad \checkmark \text{ تابع سین}$$

$$y=0 \quad n=0$$

$$7) \text{ الف) } \sqrt[3]{y} + n^2 = 2n - 2 \Rightarrow n_1 = n_2$$

$$\sqrt[3]{y_1} = -n_1^2 + 2n_1 - 2$$

$$\sqrt[3]{y_2} = -n_2^2 + 2n_2 - 2$$

$$\sqrt[3]{y_1} = \sqrt[3]{y_2}$$

$$y_1 = y_2 \quad \checkmark$$

$$\text{ب) } y'' + 2y = 0 \quad \begin{cases} y_1'' + y_1 = 0 \\ y_2'' + y_2 = 0 \end{cases} \Rightarrow y_1'' + y_1 = y_2'' + y_2$$

$$y_1'' - y_2'' = -y_1 + y_2 \Rightarrow (y_1 - y_2)(y_1' + y_2' + y_1 + y_2)$$

$$(y_1 - y_2)(y_1' + y_2' + y_1 + y_2) = -2(y_1 + y_2)$$

$$(y_1 - y_2)(y_1' + y_2' + y_1 + y_2 + 2) = 0$$

$$y_1 = y_2$$

$$\Delta = y_2'' - f(y_2'' + 2) = -2y_2'' - 2 \quad \Delta < 0$$

$$\text{تابع سین}$$

DATE / /

SUBJECT :

۱.۰) الف) $\sin y = y \sin x \Rightarrow x \approx 0 \sim y$ برای
حتمی می تواند باشد پس تابع است

ب) $\sqrt{\frac{x}{y}} = \sqrt{\frac{y}{x}} = 2 \Rightarrow a + \frac{1}{a} = 2 \Rightarrow a^2 + 1 = 2a$

$$\sqrt{\frac{x}{y}} = a$$

$$a^2 - 2a + 1$$

$$(a-1)^2 = 0$$

تابع است $(a=1)$

$$\sqrt{\frac{x}{y}} = 1$$

$$x=y \quad y \neq 0$$

~~$$a^2 - 2a + 1 = 0$$

$$a^2 - a - a + 1 = 0$$

$$a(a-1) - (a-1) = 0$$

$$(a-1)(a-1) = 0$$

$$(a-1)^2 = 0$$

$$a-1 = 0$$

$$a = 1$$~~