

۱) $4x^2 - 5x - 4 = 0 \rightarrow x^2 - 5x - 4 = 0 \rightarrow (x + \frac{1}{4})(x - \frac{9}{4}) = 0 \rightarrow x = -\frac{1}{4}, \frac{9}{4}$
 ۲) $3x^2 - 11x - 3 = 0 \rightarrow x^2 - 11x - 9 = 0 \rightarrow (x + \frac{1}{3})(x - 9) = 0 \rightarrow x = -\frac{1}{3}, 9$
 ۳) $4x^2 - 2x - 3 = 0 \rightarrow x^2 - 2x - 3 = 0 \rightarrow (x + \frac{1}{2})(x - \frac{7}{2}) = 0 \rightarrow x = -\frac{1}{2}, \frac{7}{2}$
 ۴) $2x^2 - 8x - 12 = 0 \rightarrow x^2 - 8x - 12 = 0 \rightarrow (x + 3)(x - \frac{1}{2}) = 0 \rightarrow x = -3, \frac{1}{2}$

۱) $x^2 - 8x - 12 = 0 \rightarrow (x + 2)(x - 12) = 0 \rightarrow \begin{cases} x = -2 \\ x = 12 \end{cases}$
 ۲) $2x^2 + 8x + 6 = 0 \rightarrow x^2 + 8x + 4 = 0 \rightarrow (x + \frac{1}{2})(x + \frac{7}{2}) = 0 \rightarrow x = -\frac{1}{2}, -\frac{7}{2}$
 ۳) $x^2 + 2x + 3 = 0 \rightarrow x^2 + 2x + 1 = -2 \rightarrow (x + 1)^2 = -2 \rightarrow (x + 1)^2 = -2 \rightarrow x + 1 = \pm \sqrt{-2} \rightarrow x = -1 \pm \sqrt{-2}$
 ۴) $3x^2 + 4x - 2 = 0 \rightarrow \Delta = 16 - 4(3)(-2) = 40 \rightarrow x = \frac{-4 \pm \sqrt{40}}{6} \rightarrow x = \frac{-2 \pm \sqrt{10}}{3}$

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

۱) $f(n) = \{(3, m), (2, 1), (-3, m), (-2, m), (3, m+2), (m, 2)\}$
 $m^2 = m + 2 \rightarrow m^2 - m - 2 = 0 \rightarrow a + c = b \rightarrow \begin{cases} 3 \\ 2 \end{cases} \rightarrow \begin{cases} 3 \\ 2 \end{cases} \rightarrow (3, 1), (2, 1), (3, -1), (-2, -1), (3, 1), (-1, 2)$
 ۲) $g(n) = \{(3, m^2), (2, 1), (m, 2), (3, m+2), (-2, m), (-1, 2)\}$
 $m^2 = m + 2 \rightarrow \begin{cases} 3 \\ 2 \end{cases} \rightarrow \begin{cases} 3 \\ 2 \end{cases} \rightarrow (3, 1), (2, 1), (3, 1), (-2, 1), (3, 1), (-1, 2)$

$f(n) = \{(1, a^2), (1, 3a-2), (a^2, 3a+2)\}$
 $a^2 = 3a - 2 \rightarrow a^2 - 3a + 2 = 0 \rightarrow a + b + c = 0 \rightarrow \begin{cases} 1 \\ 2 \end{cases} \rightarrow \begin{cases} 1 \\ 2 \end{cases} \rightarrow (1, 1), (1, 1), (1, 5) \rightarrow \begin{cases} 1 \\ 2 \end{cases}$
 $\begin{cases} 1 \\ 2 \end{cases} \rightarrow \begin{cases} 1 \\ 2 \end{cases} \rightarrow \begin{cases} 1 \\ 2 \end{cases} \rightarrow \begin{cases} 1 \\ 2 \end{cases} \rightarrow \begin{cases} 1 \\ 2 \end{cases}$

$$f(n) = \begin{cases} n^2 - 1 & n \leq 1 \\ an + b & 1 \leq n \leq 2 \\ n^2 & n \geq 2 \end{cases} \quad \text{①} \rightarrow x = a + b \rightarrow \boxed{a = -b}$$

$$a \times b \rightarrow 1 \times (-1) = \boxed{-1}$$

$$\text{②} \rightarrow 2a + b = 1 \rightarrow 2(-b) + b = 1$$

$$-2b + b = 1 \rightarrow -b = 1 \rightarrow \boxed{b = -1}$$

$$\boxed{a = 1}$$

$$f(n) = \begin{cases} 2n - 2 & n \geq k \\ 2 - 2n & n \leq k \end{cases} \rightarrow 2k - 2 = 2 - 2k$$

$$2k = 4 \rightarrow \boxed{k = 2}$$

$$\text{الف) } y^3 - 4y = x^2 - 2x + 3 \rightarrow y^3 - 4y + 4 = x^2 - 2x + 7 \rightarrow (y+2)^3 = x^2 - 2x + 12 \rightarrow y+2 = \pm \sqrt{x^2 - 2x + 12}$$

$$\Delta = 4 - 4(1)(12) = -44 \rightarrow \text{no real solution}$$

$$\Delta = 14 - 4(1)(12) = -44$$

$$y = \pm \sqrt{x^2 - 2x + 12} + 2$$

$$\text{ب) } y^2 + x^2 + 2x + 1 = 0$$

$$\frac{y^2}{4} + \frac{(x+1)^2}{4} = 0 \rightarrow y^2 = 0 \rightarrow y = 0$$

$$\text{ج) } |x| + |y| = 3 \rightarrow n = 0$$

$$\text{د) } |y| = \sqrt{1 - \cos x} \rightarrow n = 1 \rightarrow \cos x = -1 \rightarrow x = \pi \rightarrow y = \pm \sqrt{2}$$

$$\text{الف) } \sqrt[3]{y} + x^2 = 2n - 2 \rightarrow \sqrt[3]{y} + x^2 = 2x_1 - 2 \rightarrow \sqrt[3]{y} = 2x_1 - 2 - x^2$$

$$n=1 \rightarrow (2-2-1)^3 = (-1)^3 = -1$$

$$n=-1 \rightarrow (-2-2-1)^3 = (-5)^3 = -125$$

$$\text{ب) } y = (2n_1 - 2 - x^2)^3$$

$$y = (2n_2 - 2 - x^2)^3$$

$$\text{ج) } y^2 + 2y = 0 \rightarrow y_1^2 + 2y_1 = 0 \rightarrow y_1^2 + 2y_1 + 1 = 1 \rightarrow (y_1 + 1)^2 = 1 \rightarrow y_1 + 1 = \pm 1 \rightarrow y_1 = 0 \text{ or } -2$$

$$\text{الف) } n \sin y = y \sin x \rightarrow n = 0 \rightarrow 0 = y \times \sin(0) \rightarrow 0 = 0 \rightarrow y = 0$$

$$\text{ب) } \left(\sqrt{\frac{n}{y}} \right)^2 + \sqrt{\frac{y}{n}} = 2 \rightarrow t + \frac{1}{t} = 2 \rightarrow t^2 + 1 = 2t \rightarrow t^2 - 2t + 1 = 0$$

$$a + b + c = 1 \rightarrow t = 1$$

$$\sqrt{\frac{n}{y}} = 1 \rightarrow \frac{n}{y} = 1 \rightarrow n = y$$