

$y = m^2 + 4m + 20$ ext $\left| \begin{array}{l} -\frac{b}{2a} \\ -\frac{\Delta}{4a} \end{array} \right.$ Min $\rightarrow a > 0$ $-\frac{4}{2} = -2$ ✓

Min $\left| \begin{array}{l} -2 \\ -4 \end{array} \right.$ $\Delta = b^2 - 4ac$ $16 - 4 \times 1 \times 20$ $16 - 80 = -64$ $-\frac{-64}{4} = 16$ ✓

$y = -m^2 + 6m - 3$ ext $\left| \begin{array}{l} -\frac{b}{2a} \\ -\frac{\Delta}{4a} \end{array} \right.$ $\frac{-6}{-2} = 3$ ✓

$a < 0 \rightarrow$ Man $\left| \begin{array}{l} 3 \\ 1 \end{array} \right.$ $\Delta = b^2 - 4ac \rightarrow 36 - 4 \times 1 \times -3$ $36 - 12 = 24$ $\frac{-6}{-2} = 3$ ✓

ب) $-m^2 + 6m - 3 = 0 \rightarrow m^2 - 6m + 3 = 0 \rightarrow (m-1)(m-5) = 0$ $m=1, m=5$ ✓

الف) $\Delta > 0 \Rightarrow b^2 - 4ac \rightarrow 9 - 4 \times 1 \times c > 0$ ✓ $m^2 - 3m + a = 0$ معادله

ب) $\Delta = 0 \Rightarrow b^2 - 4ac \rightarrow 9 - 4 \times 1 \times c = 0$ $9 - 4c = 0 \rightarrow c = \frac{9}{4}$ ✓

ج) $\Delta < 0 \Rightarrow b^2 - 4ac \rightarrow 9 - 4 \times 1 \times c < 0 \rightarrow 9 - 4c < 0 \rightarrow 9 < 4c \rightarrow \frac{9}{4} < c$ ✓

د) $\Delta \geq 0 \Rightarrow b^2 - 4ac \rightarrow 9 - 4 \times 1 \times c \geq 0 \rightarrow 9 \geq 4c \rightarrow \frac{9}{4} \geq c$ ✓

الف) $m^2 - 2m - 1 = 0 \rightarrow m^2 - 2m + 1 = 2 \rightarrow (m-1)^2 = 2 \rightarrow m-1 = \pm\sqrt{2}$ $m = 1 \pm \sqrt{2}$ ✓

ب) $m^2 - m - 1 = 0 \rightarrow (m - \frac{1}{2})^2 = \frac{5}{4} \rightarrow m - \frac{1}{2} = \pm\sqrt{\frac{5}{4}}$ $m = \frac{1}{2} \pm \frac{\sqrt{5}}{2}$ ✓

الف) $m^2 - 2m - 1 = 0$ $\Delta = b^2 - 4ac$ $4 - 4 \times 1 \times -1 = 8$ $\frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm \sqrt{8}}{2} = 1 \pm \sqrt{2}$ ✓

ب) $m^2 + m - 1 = 0$ $\Delta = b^2 - 4ac$ $1 - 4 \times 1 \times -1 = 5$ $\frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-1 \pm \sqrt{5}}{2}$ ✓

$$\text{الف) } m^2 - 11m + 28 = 0 \rightarrow (m-4)(m-7) \rightarrow \boxed{m=4}, \boxed{m=7} \quad \checkmark \quad (2)$$

$$\text{ب) } m^2 + 3m - 28 = 0 \rightarrow (m+7)(m-4) \rightarrow \boxed{m=-7}, \boxed{m=4} \quad \checkmark$$

$$\text{الف) } \Delta m^2 - 12m + 7 = 0 \rightarrow m^2 - 12m + 3\Delta = 0 \rightarrow (m-7)(m-\Delta) \quad (2)$$

$$V, \Delta \Rightarrow \frac{V}{\Delta}, \frac{\Delta}{\Delta} = 1$$

$$\text{ب) } 3m^2 - 10m + 7 = 0 \rightarrow m^2 - 10m + 21 = 0 \rightarrow (m-7)(m-3)$$

$$V, 3 \Rightarrow \frac{V}{3}, \frac{3}{3} = 1 \quad \checkmark$$

$$\text{الف) } 2m^2 - 5m + 3 = 0 \rightarrow m^2 - 5m + 4 = 0 \rightarrow (m-2)(m-3) \rightarrow \frac{2}{3} = 1 \quad \checkmark \quad (2)$$

$$\text{ب) } 2m^2 + 5m + 3 = 0 \rightarrow \Delta = b^2 - 4ac, \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow \Delta = 25 - 24 = 1 \rightarrow \frac{-5 \pm 1}{4} = -1$$

$$\text{ج) } 2m^2 - 5m + 1 = 0$$

$$\Delta = b^2 - 4ac \rightarrow 25 - 4 = 21$$

$$\text{د) } 2m^2 + 5m + 9 = 0 \quad \Delta \rightarrow \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \frac{-5 \pm \sqrt{21}}{4}, \frac{-5 - \sqrt{21}}{4}$$

$$\Delta = b^2 - 4ac = 25 - 72 = -47$$

$$m^2 - 3m - 2 = 0$$

$$S = -\frac{b}{a} = -\frac{(-3)}{1} = 3, P = \frac{c}{a} = \frac{-2}{1} = -2 \quad \checkmark \quad (2)$$

$$S = -\frac{b}{a}, P = \frac{c}{a}$$

$$\text{الف) } S^2 - 2P = 9 - 2(-2) = 13 \quad \checkmark$$

$$\text{ب) } S^3 - 3SP = 27 - 3 \times 3 \times (-2) = 45 \quad \checkmark$$

$$\text{الف) } \begin{pmatrix} V \\ \Delta \end{pmatrix} + \begin{pmatrix} 9 \\ 7 \end{pmatrix} =$$

$$\frac{V \times 7 + 9 \times 7}{7 \times 7} = 21$$

$$\frac{9 \times 7}{7 \times 1} = 39 \quad (2)$$

$$\text{ب) } \begin{pmatrix} 9 \\ 7 \end{pmatrix} - \begin{pmatrix} 1 \\ 2 \end{pmatrix}$$

$$\frac{9 \times 2 - 1 \times 7}{2 \times 2} = 14$$

$$\frac{9 \times 2}{2} = 9$$

$$14 - 28 = -14 \quad \checkmark$$