۱- الف) $\min\left|\begin{matrix}\frac{-b}{2a}\\ \frac{-\Delta}{4a}\end{matrix}\right. \Rightarrow \min\left|\begin{matrix}1\\ -1\end{matrix}\right.$ ✓ (۱)

ب) $\max\left|\begin{matrix}\frac{-b}{2a}\\ \frac{-\Delta}{4a}\end{matrix}\right. \Rightarrow \max\left|\begin{matrix}\frac{3}{4}\\ -\frac{1}{8}\end{matrix}\right.$ ext $\left|\begin{matrix}x_S = \frac{-b}{2a} = \frac{-3}{-4} = \frac{3}{4}\\ y_S = -2\left(\frac{3}{4}\right)^2 + 3\left(\frac{3}{4}\right) - 5 = \frac{-31}{8}\end{matrix}\right.$

۲- الف) $S(2,-8)$

$\frac{-b}{2a} = 2$

$-\frac{\Delta}{4a} = -8$ ✓

ب) $S(2,5)$

$\frac{-b}{2a} = 2$

$-\frac{\Delta}{4a} = 5$ ✓

(۲)

۳- $\alpha\beta = -2$, $\alpha + \beta = 1 \Rightarrow \begin{matrix}\alpha = 2\\ \beta = -1\end{matrix}$

$\Rightarrow -4 + k + 9 - 2 = 0 \Rightarrow k + 5 = 0 \Rightarrow k = -5$ ✓ (۳)

۴- $\sqrt{\alpha} - \sqrt{\beta} = 1 \Rightarrow \alpha + \beta - 2\sqrt{\alpha\beta} = 1 \Rightarrow 5m - 2\sqrt{m} = 1$

$\Rightarrow m = 1 \Rightarrow 2x^2 - x - 1 = 0 \Rightarrow \frac{c}{a} = -\frac{1}{2}$ ✓ (۲)

۵- $S = \frac{1}{2}(\alpha - \beta) \times m$

$\frac{\sqrt{\Delta}}{|a|} * m \times \frac{1}{2} = \frac{c}{2} \Rightarrow \frac{\sqrt{m^2 + 4m + 4 - 8m}}{2} \times m \times \frac{1}{2} = \frac{c}{2}$ (۱٫۵)

$\Rightarrow \sqrt{m^2 - 4m + 4} \times m = 8 \Rightarrow |m-2| \times m = 8$

$m \geq 2 \rightarrow m^2 - 2m - 8 = 0 \rightarrow \begin{matrix}m = 4\\ m = -2\end{matrix}$ ✓

$m < 2 \Rightarrow m^2 + 2m - 8 = 0 \rightarrow \Delta < 0$

$y = x^2 - mx + 1 \Rightarrow -\frac{b}{2a} = \frac{m}{2} = \frac{4}{2}$ $y = x^2 + x + 1 \rightarrow x_S = \frac{-b}{2a} = -\frac{1}{2}$

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$\frac{-\Delta}{\xi a} = \frac{V}{\Lambda} \Rightarrow \frac{\xi a^2 - 9}{\xi a} = \frac{V}{\Lambda} \Rightarrow 8a^2 - 8a - V\xi = 0 \Rightarrow \Lambda a^2 - Va - 18a$ ۶

$\Rightarrow a^2 - Va - 1\xi\xi = 0 \Rightarrow (a-14)(a+9) = 0 \Rightarrow a < \begin{matrix} 14 \\ -9 \end{matrix} \xrightarrow{\div \Lambda} a < \begin{matrix} \checkmark\ 2 \\ -\frac{9}{\Lambda} \times \end{matrix}$ (۴) ✓

$\frac{\sqrt{\Delta}}{|a|} = 2 \Rightarrow \frac{\sqrt{a^2+2a+1-4a}}{1} = 2 \Rightarrow \frac{\sqrt{a^2-2a+1}}{1} = 2$ ۷

$\Rightarrow \frac{a-1}{1} = 2 \Rightarrow a-1 = 2 \Rightarrow a = 3 \Rightarrow x^2 - 4x + 3 = 0 \Rightarrow (x-1)(x-3)$ (۲)

$\frac{\sqrt{\Delta}}{|a|} = 2 \Rightarrow \frac{\sqrt{100-4b}}{1} = 2 \Rightarrow 100-4b = 4 \Rightarrow b = 24 \Rightarrow x^2 - 10x + 24 = 0$

$\Rightarrow (x-4)(x-6) \Rightarrow (6 \times 4) - (2 \times 1) = 22$ (۱/۵)

$-\frac{b}{2a} = \frac{-a}{-2a} = \frac{1}{2}$ ، $-\frac{\Delta}{4a} = \frac{a^2+8a}{4a}$ ، $-\frac{b}{4a} = \frac{b}{4b} = \frac{1}{4}$ ، $-\frac{\Delta}{4a} = \frac{b^2+8b}{8b}$ ۸

$\Rightarrow 4bx^2 - bx - 1 = 0 \Rightarrow x = \frac{1}{2} \Rightarrow \frac{1}{4}b - \frac{1}{2}b - 1 = \frac{a^2+8a}{4a} \Rightarrow a^2+8a = -4a \Rightarrow a^2+12a = 0$

$\Rightarrow a(a+12) = 0$ $a < \begin{matrix} 0 \\ -12 \end{matrix}$ ✓ $\quad ax^2 + ax + 2 \Rightarrow 12x^2 - 12x + 2 \Rightarrow x = \frac{1}{2}$

$\Rightarrow -\frac{1}{2} = \frac{b^2+8b}{8b} \Rightarrow -8b = 4b^2 + 32b = 0 \Rightarrow 4b^2 + 40b = 0 \Rightarrow 4b(b+10) = 0 \Rightarrow b = -10$

$-\frac{a}{12} + \frac{a}{4} + 2 = \frac{-b}{8} - 1 \rightarrow \frac{12}{12} = \frac{-b}{8} \rightarrow b = -6$ $\quad -10 - (-12) = 2$ $\quad b - a = -6 - (-12) = 6$

$\alpha + \beta = \frac{-4}{2a}$ ، $\alpha\beta = \frac{b}{2a} \Rightarrow 2a^2 + 2ab = -4$ ، $2a^2 b = b$ ۹

$\Rightarrow 2a^2 = 1 \Rightarrow a = \pm\frac{1}{2} \Rightarrow 2ab = -2$ ، $2 \times \frac{1}{2} \times b \Rightarrow b = -1$ (۲)

$2ab = -2$ ، $2 \times (-\frac{1}{2}) \times b \Rightarrow b = 1$

$b > a \Rightarrow \begin{matrix} b = -1 \times \\ b = 1 \checkmark \end{matrix} \Rightarrow \alpha = -\frac{1}{2}$ ، $\beta = 1$ ✓ جواب اول

$a + b = -\frac{b}{a} \Rightarrow a + b = -a^2 - b^2 + 12 \Rightarrow a^2 + a + b^2 + b - 12 = 0$ ۱۰

$\Rightarrow a^2 + a - 6 + b^2 + b - 6 = 0 \Rightarrow (a+3)(a-2) + (b+3)(b-2) = 0$ (۱)

$\Rightarrow a < \begin{matrix} -3 \\ 2 \end{matrix}$ ✓ $\quad b < \begin{matrix} -3 \times \\ 2 \checkmark \end{matrix}$ $\quad a + b = 6$ $\quad x^2 - \underbrace{(a^2+b^2-12)}_{S=-\frac{b}{a}}x + \underbrace{a+b-1}_{P=ab} = 0$

$\rightarrow \begin{cases} a^2+b^2-12 = \frac{-b}{a} \rightarrow S^2 - 2P - 12 = S & \text{I} \\ a+b-1 = ab \rightarrow S - 1 = P & \text{II} \end{cases}$

$\rightarrow S^2 - 2(S-1) - 12 = S \rightarrow S^2 - 3S - 10 = 0 \rightarrow (S-5)(S+2) = 0 \rightarrow \begin{cases} S = -2 \times \\ S = 5 \checkmark \end{cases}$