

$$-\frac{b}{2a} = 2 \rightarrow \frac{1}{2-2a} = 2 \rightarrow 1-2a = 1 \rightarrow a = \frac{3}{4}$$

$$\rightarrow y = -\frac{x^2}{4} + x + 3 \rightarrow -x^2 + 4x + 12 = 0 \rightarrow -(x^2 - 4x - 12) = 0$$

$$\rightarrow -(x-4)(x+2) = 0 \rightarrow x = \textcircled{4}, -2$$

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$$a < 0 \rightarrow m < 0 \textcircled{1}$$

$$\Delta > 0 \rightarrow 2\omega - 4m^2 > 0 \rightarrow \frac{2\omega}{4} > m^2 \rightarrow \frac{\omega}{2} > m^2 \textcircled{2}$$

$$\textcircled{1}, \textcircled{2} \rightarrow m \in (-\frac{\sqrt{\omega}}{2}, 0)$$

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$$a(x^2 - 5x + p) = y \rightarrow 5 = \frac{3-\sqrt{5}}{3} + \frac{3+\sqrt{5}}{3} = 2, p = \frac{3+\sqrt{5}}{3} \times \frac{3-\sqrt{5}}{3} = \frac{4}{3}$$

$$\rightarrow y = a(x^2 - 5x + \frac{4}{3}) \xrightarrow{a=3} y = 3x^2 - 15x + 4$$

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$$3\alpha^2 + \beta^2 = 2\alpha^2 + (\alpha^2 + \beta^2) = 2\alpha^2 + (5^2 - 2p) = 12 \rightarrow 2\alpha^2 + (14 - 2m) = 12$$

$$\rightarrow 2\alpha^2 - m = -2 \textcircled{1} \text{ و } 2\alpha^2 = 14 - m - 2 \rightarrow 14 - m - 2 \rightarrow 12 - m = 0 \rightarrow 12 = m$$

$$\rightarrow 2\alpha^2 - 12 = 0 \rightarrow 2\alpha(\alpha - 2) = 0 \rightarrow \alpha = 0, 2$$

$$\left. \begin{array}{l} \underline{\alpha=2} \rightarrow 3(2^2) + \beta^2 = 12 \rightarrow \beta = 0 \\ \underline{\alpha=0} \rightarrow 3(0^2) + \beta^2 = 12 \rightarrow \beta = +2\sqrt{3}, -2\sqrt{3} \end{array} \right\} \alpha=0 \rightarrow m+2=0 \rightarrow m=-2$$

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$$c = 0 \rightarrow y = ax^2 + bx + 0, -\frac{b}{2a} = 2 \rightarrow b = -4a$$

$$\rightarrow y = ax^2 - 4ax + 0 \xrightarrow{x=2} 4a - 8a + 0 = 9 \rightarrow a = -1, b = 4$$

$$\rightarrow y = -x^2 + 4x + 0 \rightarrow -x^2 + 4x + 0 = 0 \rightarrow x = -1, 0$$

$$-x^2 + 4x + 0 > 0 \rightarrow x \in [-1, 0]$$

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$$\rho = \alpha\beta = \frac{9\beta}{\alpha} \rightarrow \alpha = \pm 3 / S = \alpha + \beta = \frac{V}{\alpha}$$

$$\left. \begin{array}{l} \underline{\alpha=3} \rightarrow 3+\beta = \frac{V}{3} \rightarrow \beta = -\frac{V}{3} \text{ ÜÜÜ } \\ \underline{\alpha=-3} \rightarrow -3+\beta = -\frac{V}{3} \rightarrow \beta = \frac{V}{3} \checkmark \end{array} \right\} \alpha = -3, \beta = \frac{V}{3}$$

$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha+\beta}{\alpha\beta} = \frac{-\frac{V}{3}}{-3} = \frac{V}{9}$$

$$\underline{\alpha^2 = 3m - m\alpha} \rightarrow \underline{\alpha^2 - m\beta} = m(-\alpha - \beta + 3) = 1 \rightarrow m(m+3) = 1$$

$$-\alpha - \beta = -S = m \quad \hookrightarrow m = 3 - 6$$

$$\left. \begin{array}{l} \underline{m=3} \rightarrow x^3 + 3x - 6 = 0 \rightarrow \Delta > 0 \checkmark \\ \underline{m=-6} \rightarrow x^3 - 6x + 1 = 0 \rightarrow \Delta < 0 \text{ ÜÜÜ } \end{array} \right\} \Rightarrow m=3 \rightarrow x^3 + 3x - 6 = 0$$

$$\alpha + \beta = -\frac{b}{a} = -3$$

$$-\frac{\Delta}{6a} = 1 \rightarrow \frac{14 - 3m^2 - 6m}{6m} = -1 \rightarrow 3m^2 - 6m - 14 = 0$$

$$\rightarrow m^2 - 2m - \frac{7}{3} = 0 \rightarrow (m-1)(m+7) = 0 \rightarrow m = \frac{1}{3} \text{ oder } -\frac{7}{3}$$

$$m < 0 \rightarrow m = -\frac{7}{3} \rightarrow f(x) = -\frac{7}{3}x^3 + 7x + 4 \rightarrow -\frac{7}{3}x^3 + 7x + 4 = 0$$

$$\rightarrow x = -1, 3 \Rightarrow h = 3$$

$$y = ax^2 + bx + c \xrightarrow{c=3} y = ax^2 + bx + 3 \quad \& -\frac{b}{2a} = 3 \rightarrow b = -6a$$

$$\rightarrow y = ax^2 - 6ax + 3 \xrightarrow{x=3} 9a - 18a + 3 = 4 \rightarrow a = -\frac{1}{9}$$

$$\rightarrow y = -\frac{x^2}{9} + 2x + 3 \rightarrow \frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha+\beta}{\alpha\beta} = \frac{S}{P} = \frac{3}{-1} = -3$$

$$\underline{x=3} \rightarrow 3 - 18a - 1 + 9a^2 + 4a + 3 = 0 \rightarrow 9a^2 - 14a + 1 = 0 \rightarrow a = 1 \text{ oder } \frac{1}{9}$$

$$\underline{a=1} \rightarrow x^2 - 18x + 12 = 0 \rightarrow x = 3, 4$$

$$\underline{a=\frac{1}{9}} \rightarrow x^2 - \frac{1}{9}x + \frac{1}{9} = 0 \rightarrow x = 3, \frac{1}{3}$$