-۱

$y = a(x-h)^2 + k$ $\quad h=-1,\ k=9$

$y = a(x+1)^2 + 9$

$y \to 1,\ x \to 3$ $\qquad 1 = a(4)^2 + 9 \to 16a = -8 \to a = \frac{-1}{2}$

$$\frac{-x^2}{2} + bx + c = y$$

$$= \frac{-1}{2}(x+1)^2 + 9 \to \frac{-x^2}{2} - \frac{1}{2} - x + 9$$

$x^2 + 1 + 2x$

$$\boxed{\frac{-x^2}{2} - x + \frac{17}{2} = y}$$

-۲

$2x^2 + mx + m + 6 = 0$ $\qquad \Delta \geq 0$

$\Delta = m^2 - 4(2)(m+6) \geq 0$

$m^2 - 8m - 48 \geq 0$

$$m = \frac{8 \pm \sqrt{64 + 192}}{2} = \frac{8 \pm 16}{2}$$

$m = 12 \quad , \quad m = -4$

$m \leq -4$ یا $m \geq 12$

$S = x_1 + x_2 = \frac{-m}{2} > 0 \to m < 0$

$P = x_1 x_2 = \frac{m+6}{2} > 0 \to m > -6$

$\cap \to (-6, -4]$

-۳

$$3x^2 + (2m-1)x + 2 - m = 0$$

$\Delta > 0$ $\qquad \alpha + \beta = \frac{-b}{a} = \frac{1-2m}{3}$

$$\alpha\beta = \frac{c}{a} = \frac{2-m}{3}$$

$$\frac{1-2m}{3} = \frac{3}{2-m} \longrightarrow (2-m)(1-2m) = 9$$

$$\alpha + \beta = \frac{1}{\alpha\beta}$$

$$2m^2 - 5m - 7 = 0$$

$$m = \frac{5 \pm \sqrt{25 - 4(2)(-7)}}{4} = \frac{7}{2}, \ -1$$

$\frac{7}{2} - 6\,34 + 9\times 2 > 0$ قق

$-1-6(1-12 = -11 < 0$ غقق

$$(2m-1)^2 - 4(2-m)\times 3 > 0$$

$\frac{7}{2}$

-۴

$$x^2 - x - 4 = 1$$

$S = 1$

$P = -4$

$$\alpha + \beta = (x_1 + x_2)^3 - 3x_1x_2(x_1 + x_2) + \frac{x_1 + x_2}{x_1x_2}$$

$$\to 1 + 12 - \frac{1}{4} = \frac{51}{4}$$

$$\alpha\beta = (x_1 x_2)^3 + (x_1 + x_2)^2 - 2x_1x_2 + \frac{1}{x_1x_2}$$

$$\to -64 + 1 + 8 - \frac{1}{4} = \frac{-221}{4}$$

$$4\times\left(x^2 - \frac{51}{4}x - \frac{221}{4}\right) = 0$$

$$4x^2 - 51x - 221 = 0$$

-۵

$$\left(\sqrt[3]{x^2} + \frac{1}{\sqrt[3]{x^2}} + 1\right)\left(\sqrt[3]{x^2} - 1\right) = 2\sqrt[3]{x}$$

$$\left(x\sqrt[3]{x} - \frac{1}{\sqrt[3]{x^2}}\right) = \frac{x^2 - 1}{\sqrt[3]{x^2}} = \frac{2\sqrt[3]{x}}{1} \to$$

$$x^3 - 1 = 2x \to x^3 - 2x - 1 = 0$$

Senobar

$\Delta = ۴ - ۴ \times ۱ \times (-۱) = ۸$

$\frac{۲ \pm \sqrt{۸}}{۲} = \begin{cases} \frac{۲+\sqrt{۸}}{۲} \\ \frac{۲-\sqrt{۸}}{۲} \end{cases}$

$\frac{۲+\sqrt{۸}}{۲} + \frac{۲-\sqrt{۸}}{۲} = \frac{۴}{۲} = ۲$

۶-

$S = x_1 + x_2 = ۴x = \frac{a}{۳}$

$x \quad ۳x$

$P = \frac{c}{a} = ۳x^۲ = \frac{۴}{۳}$

$x^۲ = \frac{۴}{۹} \rightarrow x = \pm\frac{۲}{۳}$

$۴ \times \frac{۲}{۳} = \frac{a}{۳} \rightarrow a = ۸$

$۴ \times \frac{-۲}{۳} = \frac{a}{۳} \rightarrow a = -۸$

$۴ \times \frac{۲}{۳} = \frac{-a}{۳} \rightarrow a = -۸$

$۸ - (-۸) = ۱۶$

$-۸ - ۸ = -۱۶$

$۳x^۲ - ۸x + ۴ = ۰$

$\Delta = ۶۴ - ۴ \times ۳ \times ۴ = ۱۶ \rightarrow \frac{۸ \pm ۴}{۶} \begin{cases} ۲ \\ \frac{۲}{۳} \end{cases}$

$y = ax^۲ + (۳+۲a)x$

۷- $a > ۰$

$\frac{-b}{a} \geq ۰ \rightarrow \frac{-۳-۲a}{a} \geq ۰ \rightarrow a \leq -\frac{۳}{۲}$

| $-\frac{۳}{۲}$ | | ۰ | |
|---|---|---|---|
| − | + | | − |

$a > ۰$

$[-\frac{۳}{۲}, ۰)$

$۰ < a \leq -\frac{۳}{۲}$

$a > ۰$

۸-

$x = \frac{-b}{2a} \to \frac{-a}{2} = \frac{+2}{-2} \to \frac{a}{2} = -1 \to a = +2$

نقطه های $(p, 1)$ ، $(q, 1)$ $\to y = 1$ متقاطع

$(p, 1)$ $\quad y = x^2 - 2x - 2 = 1 \to 1 = p^2 + 2p - 2 \to p = 1 ,\ p = -3$

$y = -x^2 - 2x + b \xrightarrow{(1,1)} 1 = -1 - 2\times 1 + b \to b = 4$

$1 = -(-3)^2 - 2\times(-3) + b \to b = 4$

$ab = 2 \times 4 = 8$

۹-

$t \to 2ax^2 + ax - 9$

$t + \frac{1}{2} \to 2x^2 - ax + b$

(1) $2at^2 + at - 9$

$2(t + \frac{1}{2})^2 - a(t + \frac{1}{2}) + b = 2t^2 + (2-a)t - \frac{a}{2} + b + \frac{1}{2}$ (2)

$t^2 + t + \frac{1}{4}$

$(I = II) \quad 2at^2 + a t (-9) = 2t^2 + (2-a)t - \frac{a}{2} + b + \frac{1}{2}$

$\begin{cases} a = 1 \\ b = -9 \end{cases}$

$\left[\frac{ab}{4}\right] = \left[\frac{-9\times 1}{4}\right] \to \left[\frac{-9}{4}\right] = -1$

$x = a \to$ طول راس

۱۰-

$a^2 + 6a + m = a^2 + 2a - 3m$

$a = -m$

$m^2 - 2m - 3m$

$m^2 - 5m$

$m(m - 5) = 0$

$m^2 - 6m + m = 0$

$m^2 - 5m = 0 \to m(m-5)$

$(x-۳)(x+۵)$ $\qquad x=۳$, $x=-۵$

$x^۲+۲x-۱۵$

$x^۲+۶x+۵=0$

$(x+1)(x+۵) \Rightarrow x=-1$

$x=-۵$

$۳-(-1)=۴$

$-1-۳=-۴$