



$$y = ax^2 + rx + a \rightarrow \min \Rightarrow ay_0 \text{ ①}$$

$$r \times t \left\{ \begin{aligned} \frac{-b}{2a} &= \frac{r}{2a} \\ \frac{-\Delta}{2a} &= \frac{-9 + 4a^2}{2a} \end{aligned} \right. \rightarrow -14 + 4a^2 = 9a \rightarrow 4a^2 - 9a - 14 = 0$$

$$\rightarrow a_1, a_2 = \frac{9 \pm \sqrt{(-9)^2 - 4(4)(-14)}}{8} \rightarrow a_1 = \frac{9+14}{8} = 2 \quad \text{①} \quad \boxed{a=2}$$

$$a_2 = \frac{9-14}{8} = -\frac{5}{8}$$

نقطه کمال است

$$x^2 - (a+1)x + a = 0 \rightarrow a+b+c=0 \rightarrow r+1=2$$

$$x^2 - (2a+1)x + b = 0 \rightarrow a=2 \rightarrow x^2 - 5x + b = 0 \rightarrow rK, rK+r$$

$$x_1 + x_2 = rK + r \quad (x_1 = 2) \quad (x_2 = 4)$$

$$2K + r - 2a + 1 \Rightarrow K = 2$$

$$(2 \times 4) - (2 \times 1) = 6$$

$$y = -ax^2 + ax + r \rightarrow S: (\frac{1}{4}, \frac{a}{4} + r)$$

$$y = 2bx^2 - bx - 1 \rightarrow S: (\frac{1}{4}, -\frac{b}{4} - 1)$$

$$2b(\frac{1}{4}) - b(\frac{1}{4}) - 1 = \frac{a}{4} + r \rightarrow \frac{a}{4} = -r \rightarrow a = -4r$$

$$-a(\frac{1}{4}) + a(\frac{1}{4}) + r = -\frac{b}{4} - 1 \rightarrow \frac{r}{4} - r + r = -\frac{b}{4} - 1 \rightarrow b = -4$$

$$b - a = -4 - (-12) = 8$$

$$y = r\alpha x^2 - rx + \beta, \beta > \alpha, \beta + \alpha = -\frac{b}{a} = -\frac{r}{r\alpha a} \text{ ①}$$

$$\alpha\beta = \frac{\beta}{r\alpha a} \rightarrow \alpha^2 = \frac{1}{ra} \rightarrow \alpha = \pm \frac{1}{\sqrt{ra}}$$

$$x = \alpha = r\alpha x^2 - rx + \beta = 0 \rightarrow \alpha x + \beta = 0 \quad \beta = -\alpha x$$

$$\alpha = -\frac{1}{a}, \beta = 1$$

$$\text{① } -ax^2 + rx + 1 \rightarrow \text{ext} \left\{ \begin{aligned} \frac{-b}{2a} &= \frac{-r}{2(-a)} = \frac{r}{2a} = \frac{r}{a} \\ y &= \frac{9}{a} \end{aligned} \right. \left\{ \begin{array}{l} \text{نقطه کمال (معمولی)} \\ \text{نقطه کمال (معمولی)} \end{array} \right.$$

$$ar + b = -\frac{b}{ra} \rightarrow ar + b = -\frac{b}{ra} - 1 \rightarrow sr - rp - 1r = 5$$

$$ab = \frac{r}{a} \rightarrow ar + b - 1 = ab \rightarrow s - 1 = p \rightarrow sr - rs + r - 1r - 5 = 0$$

$$s^2 - 13s - 10 = 0 \rightarrow (s-14)(s+1) = 0 \rightarrow \boxed{s=14}$$

$$s = -1 \rightarrow \text{غیر طبیعی باشد}$$

5

5

5

5

5