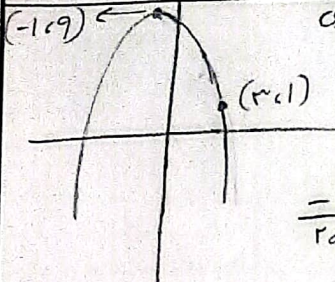


۱۸/۲۵



نقطه برآیند: $(2, 1)$
نقطه روی سهمی: $(-1, 9)$
سهمی max دارد

$$y = ax^2 + bx + c \quad \text{ext} \begin{cases} \frac{-b}{2a} = -1 \\ \frac{-\Delta}{4a} = 9 \end{cases}$$

$$\begin{cases} 9 = a - b + c \\ \Rightarrow 9 = c - a \\ 1 = 9a + 3b + c \\ \Rightarrow 1 = 10a + c \end{cases} \Rightarrow \begin{cases} a = -\frac{1}{4} \\ c = \frac{13}{4} \end{cases}$$

$$\frac{-b}{2a} = -1 \Rightarrow b = 2a$$

$$\begin{cases} a = -\frac{1}{4} \\ b = -\frac{1}{2} \end{cases} \Rightarrow \boxed{y = -\frac{1}{4}x^2 - x + \frac{13}{4}}$$

$$2x^2 + mx + m + 4 = 0$$

$$\Delta > 0 \Rightarrow m^2 - 4m - 4 > 0$$

$$\Rightarrow (m - 12)(m + 4) > 0$$

$$\frac{-4}{+1} \quad \frac{12}{+1} \Rightarrow \begin{cases} m < -4 \\ m > 12 \end{cases}$$

$$a\beta > 0 \Rightarrow \frac{c}{a} > 0 \Rightarrow \frac{m+4}{2} > 0$$

$$\frac{-4}{-1+} \Rightarrow m > -4$$

$$a+\beta > 0 \Rightarrow \frac{-b}{a} > 0 \Rightarrow \frac{-m}{2} > 0$$

$$\frac{0}{+1-} \Rightarrow m < 0$$

$$\Rightarrow \boxed{-4 < m < 0}$$

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

$$\alpha + \beta = \frac{1}{\alpha\beta} \Rightarrow \frac{-b}{a} = \frac{a}{c} \Rightarrow a^2 = -bc$$

$$9 = 2m^2 - 4m + 2 \Rightarrow 2m^2 - 4m - 7 = 0 \Rightarrow m^2 - 2m - 3.5 = 0 \Rightarrow (m-5)(m+1) = 0$$

$$\begin{cases} m = -1 \rightarrow \text{دلتا منفی} \\ m = \frac{7}{2} \rightarrow \text{دلتا مثبت} \end{cases}$$

$$x = x^2 - 1 \Rightarrow x^2 - x - 1 = 0$$

$$S = x_1 + x_2 = 1$$

$$P = x_1 x_2 = -1$$

$$x_1^2 + \frac{1}{x_1} + x_2^2 + \frac{1}{x_2} = x_1^2 + x_2^2 + \frac{x_1 + x_2}{x_1 x_2} = S^2 - 2Ps + \frac{S}{P} = 1 + 12 - \frac{1}{-1} = \frac{14}{-1} = -\frac{14}{1}$$

$$(x_1^2 + \frac{1}{x_1})(x_2^2 + \frac{1}{x_2}) = (x_1 x_2)^2 + x_1^2 x_2^2 + \frac{1}{x_1 x_2} = (-1)^2 + 1 + \frac{1}{-1} = -\frac{1}{-1} = \frac{1}{1}$$

$$\boxed{10 = 4x^2 - 61x - 221}$$

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

$$\sqrt{x^2} - \frac{1}{\sqrt{x^2}} = 0 \xrightarrow{\times \sqrt{x^2}} x^2 - 1 = 0$$

$$x_1 + x_2 = \frac{-b}{a} = \boxed{2}$$

$$r x^r - a x + r = 0 \rightarrow a = r\beta$$

$$\alpha + \beta = r\beta = \frac{a}{r}$$

$$\alpha\beta = r\beta^r = \frac{r}{r} \Rightarrow \beta^r = \frac{r}{r} \Rightarrow \beta = \pm \frac{r}{r} \Rightarrow r\beta = \pm \frac{a}{r}$$

$$\left. \begin{array}{l} \alpha = -1 \\ \alpha = 1 \end{array} \right\} 1 - (-1) = 2 \checkmark$$

(2)

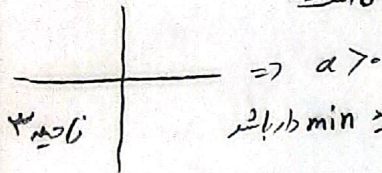
6

$$y = a x^r + (r + r a) x + \dots$$

عری اربا 10 =

$$\frac{-b}{r a} > 0 \Rightarrow \frac{-(r + r a)}{r a} > 0$$

نی 2 رد
3 و 4 با r عری
b min با r



$\Rightarrow a > 0$
با r min

افزای صیج مقدار r عری از نا صیج r عری نمی کنند

$$\Delta = 0 \Rightarrow (r + r a)^2 = 0 \Rightarrow a = -\frac{r}{r} \rightarrow *$$

(2)

7

$$y = x^r + a x - r$$

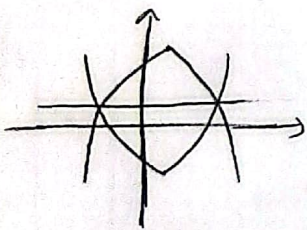
$$y = -x^r - r x + b$$

$$\frac{-b}{r a} = -1 \checkmark$$

$$1 = -x^r - r x \Rightarrow -x^r - r x - 1 = 0 \Rightarrow -(x+1)^r$$

$$1 = x^r + a x - r \Rightarrow 1 = 1 - a - r \Rightarrow a = -r$$

$$a b = 0 x - r = -r$$



$$\frac{b}{-1} = -\left(\frac{-r}{1} + r\right) \Rightarrow \frac{b}{-1} = 0 \Rightarrow b = 0$$

(1, 2)

8

$$r x^r - a x + b = 0 \rightarrow \alpha + \beta = \frac{a}{r}, \alpha\beta = \frac{b}{r}$$

$$r a x^r + a x - r = 0 \rightarrow \alpha + \beta = \frac{-a}{r a} = -\frac{1}{r}, \alpha\beta = \frac{-r}{r a} \Rightarrow \frac{-r}{r} = -1$$

$$-\frac{1}{r} + 1 = \frac{a}{r} \Rightarrow a = 1$$

$$-r + \frac{1}{r} + \frac{1}{r} = -\frac{r}{r} = \frac{b}{r} \Rightarrow b = -r$$

$$\left[\frac{a b}{r} \right] = \left[\frac{-r}{r} \right] = \left[-1 \right] = -1 \checkmark$$

(2)

9

$$x^r + 4 x + m = 0$$

$$x^r + r x - r m = 0$$

$$\left. \begin{array}{l} r x + r m = 0 \\ \Rightarrow x = -m \end{array} \right\}$$

$$r - (-1) = r \checkmark$$

$$m^r - 4 m + m = 0 \rightarrow m = 0$$

$$\left. \begin{array}{l} x^r + 4 x + m = 0 \rightarrow x = -1 \\ x = -\omega \\ x^r + r x - 1 \omega = 0 \rightarrow x = r \\ x = -\omega \end{array} \right\}$$

2
ر
شتر

(2)

10

$$-\frac{a}{r} = \frac{r}{-r} \rightarrow \boxed{a = r}$$

-1

$$1 = u^r + r u - r \rightarrow (u+r)(u-1) = 0 \rightarrow \begin{cases} u=1 \rightarrow A(1,1) \\ u=r \rightarrow B(-r,1) \end{cases}$$

$$\boxed{b = r} \leftarrow 1 = -9 + 4 + b$$

$$\boxed{ab = 1}$$