

$$\alpha + \beta = 5, \alpha\beta = 2 \rightarrow \alpha = 5 - \beta \rightarrow \beta^2 = \alpha\beta - 2 \rightarrow \beta^2 = (5 - \beta)\beta - 2 = 5\beta - \beta^2 - 2 = 5\beta - 2 - \beta^2$$

$$\beta^2 = 5\beta - 2 - \beta^2 \rightarrow 2\beta^2 = 5\beta - 2 \rightarrow \beta^2 = \frac{5\beta - 2}{2}$$

$$10\alpha(\beta - 2) - 4\beta = \beta^5, 4\beta^4\beta - 2\beta = \beta^5$$

$$\frac{4\alpha + \beta^5}{\beta^2} = \frac{10 - 4\beta + 4\beta^4\beta - 2\beta}{2\beta - 1} = \frac{4\beta^4\beta - 19\beta}{2\beta - 1} = \frac{4\beta(5\beta - 2) - 19\beta}{2\beta - 1} = \frac{19\beta}{2\beta - 1}$$

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$$x = \frac{x_1 + x_2}{2} = \frac{3 - 1.5}{2} = 0.75 = \frac{3}{4}$$

$$S = \frac{-b}{a} \rightarrow \frac{-b}{2a} = 0.75 \rightarrow \frac{-b}{a} = 1.5$$

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$$\alpha - \beta = \frac{-\Delta}{2a} \rightarrow \frac{4}{3}K = \frac{-\sqrt{4(K^2 - 5)}}{1} = -2\sqrt{K^2 - 5} \rightarrow \frac{4}{3}K = 2\sqrt{K^2 - 5}$$

$$\frac{4}{3}K^2 = K^2 - 5 \rightarrow 5 = \frac{5}{3}K^2 \rightarrow K^2 = 3$$

$$\rightarrow \left[\frac{K^2}{3} \right] = \left[\frac{3}{3} \right] = 1$$

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$x = \frac{3 + (-1)}{2} = \frac{-2}{2} = -1$ چون دو نقطه داریم پس دو جواب هستند. طول از همی نسبتاً دور است. وسط این دو نقطه قرار دارد.

$$f = 2a^2 - ab + c$$

$$f = 9a + 2b + c$$

$$14a - ab + c = 2a^2 - ab + c$$

$$14a = 2a^2 \rightarrow a = 7$$

$$\alpha^2 + \beta^2 = 5^2 - 2\alpha\beta = 25 - 2 \times 7 = 11$$

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

$$x^2 - 2px = 5 \rightarrow x^2 - 2 \times 7x = 5 \rightarrow x^2 - 14x - 5 = 0$$

$$x = \frac{14 \pm \sqrt{14^2 + 20}}{2} = \frac{14 \pm \sqrt{208}}{2}$$

$$y = x^2 - 5x + p \rightarrow x^2 + 7x - \frac{1}{4} \rightarrow y = a(x^2 + 7x - \frac{1}{4}) \rightarrow 1 = a(1 + 7 - \frac{1}{4}) \rightarrow a = \frac{4}{29}$$

$$y = \frac{4}{29}(x^2 + 7x - \frac{1}{4}) \rightarrow y = \frac{1}{4}$$

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① $\Delta > 0 \rightarrow 25 + 4m > 0 \rightarrow m < -\frac{25}{4}$

② $x < \frac{9}{2} \rightarrow \frac{-b}{2a} = \frac{-5}{-2} = 2.5 \rightarrow$ این شرط به سبب قرار گرفتن در بازه

③ $f(5) < 0 \rightarrow -(5)^2 + a(5) + m < 0 \rightarrow -25 + 5a + m < 0 \rightarrow m < -5a + 25$

④ $f(9) < 0 \rightarrow -81 + 9a + m < 0 \rightarrow m < -9a + 81$

⑤ $m = \begin{cases} -4, -5, -6, -7 \end{cases}$

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$y = \frac{-\Delta}{\epsilon a} = \frac{12\epsilon - 4(n)(am-1)}{\epsilon m} = \frac{m(am-1)-4}{m} = 2 \rightarrow am^2 - 4 - m = 2m$ $\rightarrow am^2 - 6m - 4 = 0 \rightarrow m^2 - 6m - 14 = 0 \rightarrow (m-3)(am+14) = 0 \rightarrow m = 3, m = -\frac{14}{a}$ $\rightarrow y = 2m^2 - 12m + 12$ $x = \frac{-b}{2a} = \frac{12}{4} = 3$ پس جواب a است، b نیز $\frac{12}{a}$ است.	6
$\alpha + \beta = -\gamma a - 1, \alpha \beta = \gamma a - 1$ $a^2 = \alpha \beta = \gamma a - 1$ $a^2 - \gamma a + 1 = 0 \rightarrow (a-1)^2 = 0 \rightarrow a = 1$ $a = 1 \rightarrow m^2 + 6m + 1 = 0 \rightarrow \Delta = 14 - 4 = 10 \rightarrow \Delta > 0$ دو ریشه دارد	7
$x^2 = t \rightarrow t^2 - 4t - 4 = 0 \rightarrow \Delta > 0 \rightarrow 49 - 4(-4) = 65$ $t_1, t_2 = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{4 \pm \sqrt{65}}{2} \rightarrow x_1 + x_2 = \sqrt{\frac{4a\sqrt{65}}{2}}, -\sqrt{\frac{4a\sqrt{65}}{2}}$ $S = x_1 + x_2 = 0$ $P = x_1 \cdot x_2 = -\left(\frac{4 \pm \sqrt{65}}{2}\right) \rightarrow r^2 \frac{4 \pm \sqrt{65}}{2} = r^2 = 2 \left(-\left(\frac{4 \pm \sqrt{65}}{2}\right)\right)^2$ $z = 29 + \sqrt{65}$	8
$\text{ent} \left \begin{array}{l} x = \frac{-2}{rk} = \frac{r}{k} \\ y = k\left(\frac{r}{k}\right)^2 - \epsilon\left(\frac{r}{k}\right) - 4 = -\frac{\epsilon}{k} - 4 \end{array} \right. \Rightarrow y = f(x) \text{ خط مستقیم است.}$ $-\frac{\epsilon}{k} - 4 = -\epsilon\left(\frac{r}{k}\right) - 4 \Rightarrow \frac{\epsilon}{k} = 2 \rightarrow k = 2$ $y = \frac{-2}{k} - 4 = -1$	9
$-m^2 + mn + 1 = -n - n \rightarrow -m^2 + (n+1)n + 1 + n = 0$ $\rightarrow \Delta < 0 \rightarrow b^2 - 4ac < 0 \rightarrow (n+1)^2 - 4(-n)(n+1) < 0$ $\rightarrow n^2 + 1 + 2n + 4m^2 + 4m = 4m^2 + 4m + 1 + 2n \geq (2m+1)^2 < 0 \rightarrow -1 < n < -\frac{1}{2}$ در این بازه وجود ندارد	10