

$$3u^2 - 5u + 4 = 0 \Rightarrow \alpha = 3\beta \Rightarrow \alpha = 3 \times \pm \frac{1}{3} = \pm 1 - 2$$

$$\frac{c}{a} = p \Rightarrow p = \frac{2}{3} \Rightarrow \alpha \cdot \beta = \frac{2}{3} \Rightarrow 3\beta \times \beta = 3\beta^2 = \frac{2}{3} \Rightarrow \beta^2 = \frac{2}{9} \Rightarrow \beta = \pm \frac{\sqrt{2}}{3}$$

$$\text{if } \beta = \frac{\sqrt{2}}{3} \Rightarrow S = -\frac{b}{a} = \frac{5}{3} \Rightarrow \alpha + \beta = \frac{5}{3} \Rightarrow 2 + \frac{\sqrt{2}}{3} = \frac{5}{3} \Rightarrow \frac{\sqrt{2}}{3} = \frac{1}{3} \Rightarrow \sqrt{2} = 1 \Rightarrow \alpha = 1$$

$$\text{if } \beta = -\frac{\sqrt{2}}{3} \Rightarrow S = -\frac{b}{a} = \frac{5}{3} \Rightarrow \alpha + \beta = \frac{5}{3} \Rightarrow -2 - \frac{\sqrt{2}}{3} = \frac{5}{3} \Rightarrow -\frac{\sqrt{2}}{3} = \frac{7}{3} \Rightarrow \sqrt{2} = -7 \Rightarrow \alpha = -7$$

$$1 - (-7) = 8$$

جواب: ۸

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$$\sqrt{\frac{1}{\alpha}} + \sqrt{\frac{1}{\beta}} = 5 \xrightarrow{\text{مربع}} \frac{1}{\alpha} + \frac{1}{\beta} + \frac{2}{\sqrt{\alpha\beta}} = 25 \Rightarrow S = \frac{m+12}{24}, P = \frac{1}{24}$$

$$\frac{\alpha+\beta}{\alpha\beta} + \frac{2}{\sqrt{\alpha\beta}} = 25 \Rightarrow m+12+12 = 25 \Rightarrow m = -1$$

$$mu^2 + 3u + 2 = 0 \Rightarrow -u^2 + 3u + 2 = 0$$

$$p = \frac{c}{a} = \frac{2}{-1} = -2$$

جواب: -2

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$$\alpha, \beta \Rightarrow u^2 - 5u + p = 0 \Rightarrow u^2 - u - 2 = 0 \Rightarrow (u-2)(u+1) = 0 \Rightarrow u = -1 \text{ or } u = 2$$

$$u = -1 \Rightarrow 2(-1)^3 + 2(-1)^2 - 9(-1) - 2 = 0 \Rightarrow -2 + 2 + 9 - 2 = 7 \Rightarrow K = 7$$

جواب: ۷

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$$u^2 + 2u + a = 0 \quad \alpha < \beta < c \quad 3\alpha^2 + 2\beta^2 = 12\sqrt{2} + 15$$

$$-4 - \frac{\sqrt{34-2a}}{2} = -3 - \sqrt{9-a} \quad \text{و} \quad \frac{-4 + \sqrt{34-2a}}{2} = -3 + \sqrt{9-a}$$

$$\alpha < \beta \Rightarrow \alpha = -3 - \sqrt{9-a} \quad \text{و} \quad \beta = -3 + \sqrt{9-a}$$

$$3\alpha^2 = 3(-3 - \sqrt{9-a})^2 = 54 - 36\sqrt{9-a} + 18(9-a)$$

$$2\beta^2 = 2(-3 + \sqrt{9-a})^2 = 36 - 12\sqrt{9-a} + 2(9-a)$$

$$3\alpha^2 + 2\beta^2 = 90 - 54\sqrt{9-a} + 4\sqrt{9-a} = 12\sqrt{2} + 15 \Rightarrow a = 1$$

جواب: ۱

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$$u^2 - 5u^2 - a = 0 \quad 2p^2 - 3sp + 2s$$

$$u^2 = t, u^2 \geq 0 \Rightarrow t^2 - 5t - a = 0 \Rightarrow t = \frac{5 \pm \sqrt{25+4a}}{2}$$

$$u_1 = \sqrt{\frac{5+\sqrt{25+4a}}{2}}, u_2 = -\sqrt{\frac{5+\sqrt{25+4a}}{2}}$$

$$p = u_1 u_2 = -\left(\frac{\sqrt{5+\sqrt{25+4a}}}{2}\right)^2 = \frac{-5-\sqrt{25+4a}}{2}$$

$$S = u_1 + u_2 = \sqrt{\frac{5+\sqrt{25+4a}}{2}} - \sqrt{\frac{5+\sqrt{25+4a}}{2}} = 0$$

$$2p^2 - 3sp + 2s = 0 \Rightarrow 2\left(\frac{-5-\sqrt{25+4a}}{2}\right)^2 = 2\left(\frac{25+4a+12\sqrt{25+4a}}{2}\right) = 50+4a+12\sqrt{25+4a}$$

جواب: ۵۰+۴ا+۱۲√(۲۵+۴ا)

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دسته: α و β : $\textcircled{2}$ $2au^2 + au - 4 = 0 \Rightarrow$ و $\textcircled{1}$ $ru^2 - au + b = 0 \Rightarrow \alpha + \frac{1}{r} \text{ و } \beta + \frac{1}{r}$ دسته $\textcircled{2} \Rightarrow \alpha + \beta = -\frac{b}{a} \text{ و } -\frac{a}{2a} = -\frac{1}{2}$ $\textcircled{1} \Rightarrow \alpha + \frac{1}{r} + \beta + \frac{1}{r} = \alpha + \beta + 1 = \frac{a}{r} \Rightarrow -\frac{1}{r} + 1 = \frac{a}{r} \Rightarrow \frac{1}{r} = \frac{a}{r} \Rightarrow a = 1$ $(\alpha + \frac{1}{r})(\beta + \frac{1}{r}) = \alpha\beta + \frac{1}{r}(\alpha + \beta) + \frac{1}{r^2} = \frac{b}{r} \rightarrow -\frac{r}{2} + \frac{1}{r}(-\frac{1}{r}) + \frac{1}{r^2} = \frac{b}{r} \Rightarrow$ $-\frac{r}{2} - \frac{1}{r} + \frac{1}{r^2} = \frac{b}{r} \Rightarrow b = -r$ $[\frac{ab}{2}] \rightarrow [\frac{1(-r)}{2}] = [-\frac{r}{2}] = \textcircled{-2}$ له جواب	6
$au^2 - au - b = 0$ $\Sigma \alpha^2 + 2\alpha\beta + \beta^2 = 14$ $\hookrightarrow \alpha + \beta = -\frac{b}{a} = \frac{a}{a} = 1$ $\Rightarrow \beta = 1 - \alpha$ $\hookrightarrow \Sigma (1 - \alpha)^2 + 2\alpha(1 - \alpha) + \alpha^2 = 14$ $\Rightarrow 4\alpha^2 - 4\alpha + 2\alpha + 2 = 14$ $\Rightarrow 4\alpha^2 - 2\alpha + 2 = 14$ $\Rightarrow 4\alpha^2 - 2\alpha - 12 = 0$ $\div 2 \Rightarrow 2\alpha^2 - \alpha - 6 = 0 \Rightarrow S = 1, P = -\frac{1}{2}$ $\alpha - \beta = \sqrt{S^2 - 4P} = \sqrt{1 - \frac{1}{2}} = \frac{\sqrt{2}}{2} \rightarrow$ جواب	7
$\textcircled{1} u^2 - (a+1)u + a = 0 \rightarrow$ دسته: دو عدد صحیح $\hookrightarrow n, n+2$ $S = n + n + 2 = 2n + 2 = a + 1 \Rightarrow a = 2n + 1$ $P = n(n+2) = n^2 + 2n = a \xrightarrow{a=2n+1} n^2 + 2n = 2n + 1$ $n^2 = 1 \Rightarrow n = \pm 1$ $\textcircled{2} u^2 - (3a+1)u + b = 0 \rightarrow$ دسته: دو عدد زوج $\hookrightarrow 1, 3 \rightarrow a = 3$ $\textcircled{2} 2k, 2k+2$ $S = 2k + 2k + 2 = 4k + 2 = 3a + 1 \xrightarrow{a=3} 4k + 2 = 10 \Rightarrow k = 2$ $\Sigma 9 \Rightarrow b = 24$ دسته: $\Sigma 9 \Rightarrow b = 24$ تفاوت حاصل ضرب $(3 \times 1) - (4 \times 4) = \textcircled{21}$ له جواب	8
$u^2 + u - 1 - m^2 = 0$ $\alpha^2 + \beta^2 = 0$ $u^2 + u - (1 + m^2) = 0$ $a + b = -1 \Rightarrow ab = -(1 + m^2)$ $\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta \Rightarrow (-1)^2 - 2(-(1 + m^2)) = 3 + 2m^2$ له کمترین مقدار وقتی است که $m^2 = 0$ باشد پس دسته: $\textcircled{3}$ $3 + 2m^2 \xrightarrow{m=0} 3 + 2(0)^2 = \textcircled{3}$ له جواب	9
$A(3, y), B(-\omega, y)$ $\alpha^2 + \beta^2 = 5$ $\textcircled{10}$ $\hookrightarrow u_3 = \frac{3 - \omega}{2} = -1$ چون ω مجهول است $y = a(u - h)^2 + k \Rightarrow y = a(u + 1)^2 + 1 \Rightarrow y = au^2 + 2au + a + 1$ $\alpha^2 + \beta^2 = 5 \Rightarrow (\alpha + \beta)^2 - 2\alpha\beta = 5 \Rightarrow 2 - 2(\frac{a+1}{a}) = 5$ $\frac{a+1}{a} = -\frac{1}{2} \Rightarrow 2a + 2 = -a$ $3a = -2$ $a = -\frac{2}{3}$ $\textcircled{10}$ $a + 1 = -\frac{2}{3} + 1 = \frac{1}{3}$ له جواب	10