ملیکا محمد حسینی

۱۶

$3x^2 - ax + 4 = 0 \qquad x + 3x = 4x = \frac{a}{3}$

$x \times 3x = 3x^2 = \frac{4}{3}$

08:00

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$x^2 = \frac{4}{9} \to x = \pm\frac{2}{3}$; $x=\frac{2}{3}$: $4x = \frac{8}{3} = \frac{a}{3} \to a = 8$

09:00

$x=-\frac{2}{3}$: $4x = -\frac{8}{3} = \frac{a}{3} \to a = -8$

10:00

$8-(-8) = 16$

11:00

$36x^2 - (m+14)x + 1 = 0$ مجموع مجذور معکوس ریشه های معادله

$\alpha+\beta = \frac{m+14}{36} \qquad \alpha\beta = \frac{1}{36}$

12:00

$mx^2 + 3x + 2 \to$ حاصلضرب ریشه

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$\frac{1}{\alpha^2} + \frac{1}{\beta^2} = \left(\frac{1}{\alpha} + \frac{1}{\beta}\right)^2 - \frac{2}{\alpha\beta}$

13:00

$\frac{\alpha+\beta+2\sqrt{\alpha\beta}}{\alpha\beta} = 25 \to \frac{\frac{m+14}{36} + 2\sqrt{\frac{1}{36}}}{\frac{1}{36}} \to m+14+12 = 25 \to m=-1$ (۲

$\frac{1}{\alpha} + \frac{1}{\beta} = m+14$

14:00

$\to -x^2+3x+2 \to \frac{c}{a} = -2$

$\frac{1}{\alpha^2} + \frac{1}{\beta^2} = (m+14)^2 - 72 \to (m+14)^2 - 72 = 5 \to (m+14)^2 = 77$

15:00

$m = -14 \pm \sqrt{77}$

$\alpha\beta = \frac{2}{m} \qquad \frac{2}{-14+\sqrt{77}} , \frac{2}{-14-\sqrt{77}}$ درجه دلری دوم

جواب

$x^2 + 6x + a = 0 \qquad \alpha < \beta < 0 \ , \ 3\alpha^2 + 2\beta^2 = 12\sqrt{2} + 85$

$\alpha + \beta = -6$

$\alpha = -3 - d \qquad \beta = -3 + d$

$\alpha \times \beta = a$

$3\alpha^2 + 2\beta^2 = 12\sqrt{2} + 85 \to \alpha^2 = (-3-d)^2 = 9 + 6d + d^2$

$\beta^2 = (-3+d)^2 = 9 - 6d + d^2$

$3(9+6d+d^2) + 2(9-6d+d^2) = 27 + 18d + 3d^2 + 18 - 12d + 2d^2 = 45 + 6d + 5d^2$

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$45 + 6d + 5d^2 = 12\sqrt{2} + 85 \to 5d^2 + 6d - 40 = 12\sqrt{2}$

$d = k\sqrt{2} \to 5(2k^2) + 6k\sqrt{2} - 40 = 12\sqrt{2}$

$10k^2 - 40 + (6k - 12)\sqrt{2} = 0$

$10k^2 - 40 = 0$, $6k - 12 = 0 \to k = 2 \to d = 2\sqrt{2} \to 9 - (2\sqrt{2})^2 = 1 \to a = 1$

$4x^3 + Kx^2 - 9x - 2 = 0 \qquad \alpha+\beta = 1 \qquad \alpha\beta = -2 \qquad K = ?$

$x^2 - (\alpha+\beta)x + \alpha\beta = 0$

$x^2 - x - 2 = 0 \qquad (x-\alpha)(x-\beta) = x^2 - x - 2$

$x = 2 \qquad x = -1$

$x = 2 \rightarrow 4(2)^3 + K(2)^2 - 9(2) - 2 = 0 \rightarrow 32 + 4K - 18 - 2 = 0$

$12 + 4K = 0 \rightarrow 4K = -12 \rightarrow \boxed{K = -3}$

$x = -1 \rightarrow \boxed{K = -3}$

2

$x^4 - 7x^2 - 5 = 0 \qquad 2P^2 - 3PS + 2S = ?$

$t^2 - 7t - 5 = 0 \rightarrow \frac{7 \pm \sqrt{49+20}}{2} = \frac{7 \pm \sqrt{69}}{2}$

2

$x = \pm\sqrt{\frac{7+\sqrt{69}}{2}} \qquad P = -\frac{7+\sqrt{69}}{2} \qquad S = 0$ دو ریشه قرینه اند

$2P^2 \rightarrow P^2 = \left(\frac{7+\sqrt{69}}{2}\right)^2 \rightarrow 2P^2 = \left(\frac{7+\sqrt{69}}{2}\right)^2$

$(7+\sqrt{69})^2 = 49 + 69 + 14\sqrt{69} = 118 + 14\sqrt{69} \rightarrow 59 + 7\sqrt{69}$

$2x^2 - ax + b = 0 \qquad 2ax^2 + ax - 6 = 0 \qquad \left[\frac{9b}{4}\right] = ?$

$x_1, x_2: \; S = \frac{a}{2} \quad P = \frac{b}{2} \qquad y_1, y_2: \; S = -\frac{1}{2} \quad P = -\frac{3}{a}$

$x_1 = y_1 + \frac{1}{2} \qquad x_2 = y_2 + \frac{1}{2}$

2

$x_1 + x_2 = y_1 + y_2 + 1 = -\frac{1}{2} + 1 = \frac{1}{2} \rightarrow \frac{a}{2} = \frac{1}{2} \rightarrow \boxed{a = 1}$

$x_1 \times x_2 = (y_1 + \frac{1}{2})(y_2 + \frac{1}{2}) = -\frac{3}{a} + \frac{1}{2} \times -\frac{1}{2} + \frac{1}{4} = -3$

$\frac{b}{2} = -3 \rightarrow \boxed{b = -6} \qquad \left[\frac{-6 \times 1}{4}\right] = -\frac{3}{2}$

$\boxed{\left[-\frac{3}{2}\right] = -2}$

روز طبیعت (تعطیل)

محمد حسینی

$ax^2 - ax - b = 0$ $\quad 40\beta^2 + 20\alpha^2 - 20\beta = 17$ 06:00

$|\alpha-\beta| = \frac{\sqrt{a^2 - 4a(-b)}}{|a|} = \sqrt{\frac{a^2+4ab}{a}} = \sqrt{1+\frac{4b}{a}}$ 09:00

10:00

$40\beta^2 + 20\alpha^2 - 20\beta = 17$ ۶

$20\alpha^2 + 40\beta^2 - 20\beta - 17 = 0$ $\quad \alpha = 1-\beta$ 11:00

$20(1-\beta)^2 + 40\beta^2 - 20\beta - 17 = 0$ 12:00

$20(\beta^2 - 2\beta + 1) + 40\beta^2 - 20\beta - 17 = 0 \to 20\beta^2 - 20\beta + 1 = 0$ 13:00

$\beta = \frac{5 \pm 2\sqrt{5}}{10}$ $\quad \alpha = 1-\beta = \frac{5 \pm 2\sqrt{5}}{10}$ 14:00

$|\alpha-\beta| = \boxed{\frac{2\sqrt{5}}{5}}$ 15:00

16:00

$x^2 - (a+1)x + 2a = 0$ $\quad x^2 - (3a+1)x + b = 0$ 17:00

$x_1x_2 = a$ $\quad n(n+2) = a \to a = n^2 + 2n$ 18:00

$x_1x_2 = b \to b = m(m+2) = m^2 + 2m$ 19:00

$x_1 + x_2 = m + (m+2) = 2m + 2$ 20:00

$x_1 + x_2 = 3a + 1$ $\quad 2m + 2 = 3a + 1 \to 2m = 3a - 1 \to m = \frac{3a-1}{2}$

$b = \frac{(3a-1)(3a+3)}{4} = \frac{9a^2 + 6a - 3}{4}$ $\quad b - a = \frac{9a^2+6a-3-4a}{4} = \frac{9a^2+2a-3}{4}$

$2n + 2 = a + 1 \to a = 2n + 1$ $\quad a = n^2 + 2n \to n^2 = 1 \to n = 1$ ۵۱
$a = 2n +$

$a = 2 \times 1 + 1 = 3$

$b = \frac{9a^2+6a-3}{4} = \frac{81+18-3}{4} = 24 \to b - a = 24 - 3 = \boxed{21}$

محمد حسینی

x^2+x-1 ۶ $\alpha^2+\beta^2=S^2-2P \to 2m^2+3 \to 2m^2 \geq 0 \to 2m^2+3 \geq 3$ ۹)

min = ۳

$x=\frac{-1\pm\sqrt{1+4(1-m)^2}}{2}$ $\alpha=\frac{-1+\sqrt{1+4(1-m)^2}}{2}$ $\beta=\frac{-1-\sqrt{1+4(1-m)^2}}{2}$

$\alpha^3+\beta^3=\left(\frac{-1+\sqrt{1+4(1-m)^2}}{2}\right)^3+\left(\frac{-1-\sqrt{1+4(1-m)^2}}{2}\right)^3=$

$(-1+\sqrt{1+4(1-m)^2})^2=1-2\sqrt{1+4(1-m)^2}+1+4(1-m)^2=2-2\sqrt{1+4(1-m)^2}$

$(-1+\sqrt{D})^2=1-2\sqrt{D}+D=1-2\sqrt{D}+(1+4(1-m)^2)=2-2\sqrt{D}+4(1-m)^2$

$1+2\sqrt{D}+1+4(1-m)^2=2+2\sqrt{D}+4(1-m)^2$

$(2-2\sqrt{D}+4(1-m)^2)+(2+2\sqrt{D}+4(1-m)^2)=4+8(1-m)^2$

$\frac{4+8(1-m)^2}{4}=1+2(1-m)^2 \to 1-m^2=0 \to m=1$

سوال ۱۰

$h=\frac{3-5}{2}=-1$ $S(-1,1)$

$a(x-h)^2+k \to f(x)=a(x+1)^2+1$

$\frac{\alpha+\beta}{2}=h \to \alpha+\beta=2(-1)=-2$ $\alpha^2+\beta^2=5$

$(\alpha+\beta)^2=\alpha^2+\beta^2+2\alpha\beta \to (-2)^2=5+2\alpha\beta \to 4=5+2\alpha\beta$

$2\alpha\beta=-1 \to \alpha\beta=-\frac{1}{2}$ $\frac{a+1}{a}=\alpha\beta=-\frac{1}{2}$

$2(a+1)=-a \to 2a+2=-a \to a=-\frac{2}{3}$ $f(0)=a+1$

$f(0)=-\frac{2}{3}+1=\frac{1}{3}$