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فرانک آقایی — تکلیف شمارۀ ۱ — یازدهم دختر C — ۱۹٫۵

1. (۲)
$\alpha=3\beta \to \alpha.\beta=3\beta^2=\frac{4}{3} \to \beta^2=\frac{4}{9} \to \beta=\pm\frac{2}{3}$

$\alpha+\beta=\frac{a}{3} \to \frac{2}{3}+2=\frac{a}{3} \to a=8$
$-\frac{2}{3}-2=\frac{a}{3} \to a=-8$
$\} \; 8-(-8)=16$

2. (۳)
$\sqrt{\frac{1}{x}}+\sqrt{\frac{1}{y}}=5 \xrightarrow{()^2} \frac{1}{x}+\frac{1}{y}+2\sqrt{\frac{1}{xy}}=25 \to 12+\left(\frac{m+14}{36}\right)\times 36=25$

$m+14$

$-x^2+3x+2=0 \to \alpha.\beta=-2$
$24+m=25 \to m=-1$

3. (۲)
$4+k-9-2=0 \to k=7 \to \alpha=1 \to \alpha+\beta=1+0=1 \to \beta=0 \to \alpha.\beta=-2$
$\downarrow$
$\beta\neq 0$ غ ق ق

$4-9=k-2 \to k=-3 \to \alpha=-1 \to \beta+\alpha=1 \to \beta=2 \to \alpha.\beta=-2$ ✓

4. (۲)
$\Delta=36-4a \to \frac{-6\pm\sqrt{36-4a}}{2} \to -3\pm\sqrt{9-a} \to \alpha^2=9+9-a-6\sqrt{9-a}$

$\beta^2=18-a+6\sqrt{9-a}$
$\downarrow$
$36-2a+12\sqrt{9-a}$

$54-3a-18\sqrt{9-a}<18-a-6\sqrt{9-a}<$

$90-5a-6\sqrt{9-a}=12\sqrt{5}+85 \to 5-12\sqrt{2}=5a+6\sqrt{9-a} \to 12\sqrt{2}=6\sqrt{9-a} \to 9-a=8 \to a=1$

5. (۲)
$t^2-7t-5=0 \to 2p^2-3Sp+2S=59+7\sqrt{69}$

$t=\frac{7\pm\sqrt{69}}{2} \to x^2=\frac{7+\sqrt{69}}{2} \to x_1=\sqrt{\frac{7+\sqrt{69}}{2}}$ $\quad x_2=-\sqrt{\frac{7+\sqrt{69}}{2}}$

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$S=0$ $\quad p=\pm\frac{7+\sqrt{69}}{2}$

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$\alpha' + \frac{1}{2} = \alpha$, $\beta' + \frac{1}{2} = \beta$ $\Big\}$ $\alpha'\beta' = \frac{-c}{2a} = \frac{3}{2}$ $\rightarrow$ $(\alpha - \frac{1}{2})(\beta - \frac{1}{2}) = \alpha\beta - \frac{\alpha}{2} - \frac{\beta}{2} + \frac{1}{4} = 3$ $\rightarrow$

$\alpha' = \alpha - \frac{1}{2}$ $\quad$ $\beta' = \beta - \frac{1}{2}$ $\quad$ $\frac{b}{2} - \frac{1}{2}(\frac{1}{2}) + \frac{1}{4} = 3 \rightarrow b = 6$ (1/3)

$\alpha + \beta = \alpha' + \beta' + 1 = \frac{1}{2} \rightarrow a = -1$ ($\alpha' + \beta' = -\frac{1}{2}$)

$2x^2 - ax + b = 0 \rightarrow 2x^2 + x + b = 0$

$[\frac{ab}{4}] = [\frac{-c}{4}] = -2$ $\quad$ $2x^2 - ax + b = 0 \Big\{ S = \frac{a}{2}, P = \frac{b}{2}$ $\quad$ $2ax^2 + ax - 4 \Big\} S = \frac{-1}{2} \rightarrow \alpha + \beta = \frac{1}{2} = \frac{a}{2} \rightarrow a = 1$, $P = -2 \rightarrow b = -4$

$[\frac{ab}{4}] = -2$

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$\alpha + \beta = 1 \rightarrow \alpha = 1 - \beta$

(5)

$4\beta^2 + 2\alpha^2 - 2\beta = 17 \rightarrow 4\beta^2 + 2(1-\beta)^2 - 2\beta = 17 \rightarrow 4\beta^2 + 2 + 2\beta^2 - 4\beta - 2\beta = 17$

$(1-\beta)^2 = 1 + \beta^2 - 2\beta$

$6\beta^2 - 6\beta + 3 = 0 \rightarrow 2\beta^2 - 2\beta + 1 = 0 \rightarrow \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{4-8}}{2} = \frac{\sqrt{36}}{2} = \frac{2\sqrt{9}}{2}$

$x_1 = 1$

.8

$x^2 - (a+1)x + a = 0 \rightarrow S = 0 \rightarrow$

$x^2 - 2x + 3 = 0 \Big\{ x = 1$ $\quad$ $x\beta \Rightarrow 1 - a - 1 + a = 0 \rightarrow 3 = \frac{a}{1} \rightarrow a = 3$

$x = 3 \rightarrow P = 3$

(5)

$x^2 - 1.x + b = 0 \rightarrow \alpha$ $\quad$ $\alpha + 2 \rightarrow 2\alpha + 2 = 10 \rightarrow \alpha = 4$

$\alpha + 2 = 6 \Big\} 24 = P$

$24 - 3 = 21$

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$\alpha^2 + \beta^2 = S^2 - 2P \rightarrow 1 + 2 + 2m^2 = 4 \rightarrow 2m^2 + 3 = 4 \rightarrow -\frac{\Delta}{4a} = \frac{24}{8} = 3$

(5)

$\alpha^2+\beta^2=\Delta \rightarrow S^2-2P=\Delta$

$ax^2+bx+c=y \rightarrow 9a+6b+c=2\Delta a+\Delta b+c$

$\Delta b=12a$

$b=2a$

$\frac{-\Delta}{4a}=1 \qquad \frac{-b}{2a}=-1$

$\frac{b^2-4ac}{4a}=-1 \rightarrow 4a^2-4ac=-4a$

$a=1$

(۲)

$a(x+1)^2+1=y \rightarrow$

$y=ax^2+2ax+a+1$

$S^2-2P=4-2\left(\frac{a+1}{a}\right)=\Delta$

$-2\left(\frac{a+1}{a}\right)=1 \rightarrow \frac{a+1}{a}=-\frac{1}{2}$

$a=-\frac{2}{3}$

$c=\frac{1}{3}$