صحرا گل‌سرخی  دختر دوازدهم A  تکلیف شماره ۱۳

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(۱) $180 - 120 = 60 : \hat{A}$

$\frac{a}{\sin A} = \frac{b}{\sin B} \Rightarrow \frac{20}{\frac{1}{\frac{\sqrt{3}}{2}}} \to \frac{40}{\sqrt{3}} = \frac{20 \times \sqrt{3} \times \sqrt{2}}{3 \times \sin B} \Rightarrow 6 \sin B = 3\sqrt{2} \to \sin B = \frac{\sqrt{2}}{2}$

$\boxed{B = 45^\circ}$

$\underset{45}{B} + C = 120 \to \boxed{C = 75^\circ}$

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(۲) $A_2 = 180 - (75 + 60) = 45 \Rightarrow \frac{\frac{2\sqrt{2}}{1}}{\frac{\sqrt{2}}{2}} = \frac{AC}{\frac{\sqrt{3}}{2}} \to AC = 2\sqrt{3}$

$\frac{a}{\sin A} = \frac{b}{\sin B}$

$\Rightarrow \frac{2\sqrt{3}}{1} = \frac{x}{\frac{\sqrt{3}}{2}} \Rightarrow \boxed{x = 3}$

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(۳) $(b^2 - 2)\left(\frac{\sin C}{\sin B}\right) = c \to (b^2 - 2)\frac{c}{b} = c \to b^2 - 2 = b \to b^2 - b - 2 = 0$

$(b - 2)(b + 1) = 0 \to \boxed{b = 2}$

$\frac{c}{\sin C} = \frac{b}{\sin B} \to \frac{\sin C}{\sin B} = \frac{c}{b}$

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(۴) $(AC)^2 = (AB)^2 + (BC)^2 - 2(AB)(BC)\cos B \Rightarrow 169 = 841 - 840 \cos B$

$672 = 840 \cos B \to \cos B = 0/8 \to$ (10, 8, 6) $\Rightarrow \boxed{\sin B = 0/6}$

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(۵) $a^2 = b^2 + c^2 - 2bc\cos A \to a^2 = 32 + 8\sqrt{3} - (2 \times 4 \times 2(1+\sqrt{3}) \times \frac{1}{2}) \quad a^2 = 24 \to \boxed{a = 2\sqrt{6}}$

$b = 4,\ c = 2(1+\sqrt{3}),\ \cos A = \frac{1}{2}$

$-8 - \cancel{8\sqrt{3}}$

$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \Rightarrow \frac{2\sqrt{6}}{\frac{1}{\frac{\sqrt{3}}{2}}} \to \frac{4 \times \sqrt{3} \times \sqrt{2}}{\sqrt{3}} \to 4\sqrt{2} = \frac{2(1+\sqrt{3})}{\sin C} \to \sin C = \frac{1+\sqrt{3}}{2\sqrt{2}}$

$\frac{2\sqrt{6}}{\frac{1}{\frac{\sqrt{3}}{2}}} = \frac{4}{\sin B} \Rightarrow 4\sqrt{2} = \frac{4}{\sin B} \to \sqrt{2}\sin B = 1 \to \sin B = \frac{1}{\sqrt{2}} \to \sin B = \frac{\sqrt{2}}{2}$

$\boxed{B = 45^\circ}$

$C : 180 - (\overset{105}{45 + 60}) = \boxed{75^\circ = C}$

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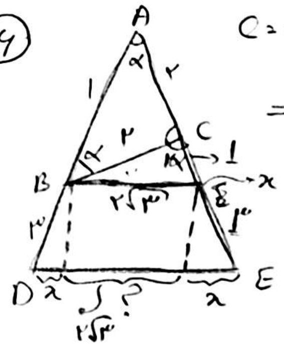

$C = (\pi - ۲\alpha)$ ABC مثلث $\longrightarrow ۴+۱-۲\times۲\times۱\times\cos\alpha = ۴ \longrightarrow \cos\alpha = ۱/۴$

$\Rightarrow a^۲ = b^۲+c^۲-۲bc\cos(\underbrace{\pi-۲\alpha}_{-\cos۲\alpha}) \Rightarrow ۱ = ۸ + ۸\cos^۲\alpha \to \cos۲\alpha = \frac{-۷}{۸}$

$(Bx)^۲ = ۴+۱-۴\times۴\times۱\times\frac{-۷}{۸} \longrightarrow \boxed{Bx = ۲\sqrt۳}$

$\overset{\triangle}{ADE} \to ۳۶+۱۶-۱۲=۴۰$

تالس: $\frac{۱}{۴} = \frac{۲\sqrt۳}{DE} \longrightarrow \boxed{DE = ۸\sqrt۳}$

$a^۲ = ۴۰$

$\boxed{a = \sqrt{۴۰} = ۲\sqrt{۱۰}}$

۷ $a^۲ = b^۲+c^۲-۲bc\cos A \to (BC)^۲ = ۸۹ - \cancel{۲}\times\cancel{۵}\times۸\times\frac{۱}{\cancel{۲}} \longrightarrow \boxed{BC = ۷}$

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$\frac{۱}{۲}\times۸\times۵\times\frac{\sqrt۳}{۲} \to ۱۰\sqrt۳ \leftarrow$ مساحت

$\frac{۱}{۲}\times ab\times\sin a$

۸ $\frac{(b+c)^۲-a^۲}{bc(\cos A+۱)} = \frac{\cancel{b^۲}+\cancel{c^۲}+۲bc-\cancel{b^۲}-\cancel{c^۲}+۲bc\cos A}{bc(\cos A+۱)} \Rightarrow \frac{۲\cancel{bc}(\cancel{\cos A+۱})}{\cancel{bc}(\cancel{\cos A+۱})} = \boxed{۲}$

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۹ $\frac{a^۳+b^۳-c^۳}{a+b-c} = a^۲ \Rightarrow \cancel{a^۳}+b^۳-c^۳ = \cancel{a^۳}+ba^۲-ca^۲ \Rightarrow (\cancel{b-c})(b^۲+bc+c^۲) = a^۲(\cancel{b-c})$

$b^۲+c^۲-۲bc\cos A$

$\cancel{b^۲}+\cancel{c^۲}+bc = \cancel{b^۲}+\cancel{c^۲}-۲bc\cos A \to bc+۲bc\cos A = ۰ \to bc(۱+۲\cos A) = ۰$

مخالف صفر (I)

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$(I) \Rightarrow ۱+۲\cos A \longrightarrow \boxed{\cos A = \frac{-۱}{۲}} \longrightarrow \hat{A} = ۱۲۰$

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۱۰ $S = \frac{۱}{۲}bc\times\sin A \Rightarrow \frac{۱}{۲}\times(۱+۳\cos\theta)\times(۳-\cos\theta)\times\frac{۱}{۲} = ۲$

$۳+۸\underset{t}{\cos\theta}-۳\cos^۲\theta = ۸ \to ۳t^۲-۸t+۵=۰ \to t^۲-۸t+۱۵=۰ \to (t-۵)(t-۳)=۰$

$\cos\theta = \frac{۵}{۳}$ ✗ غلط

$\cos\theta = \frac{۳}{۳} = ۱$

$a^۲ = ۴+۱۶-\cancel{۲}\times۲\times۴\times\frac{۱}{\cancel{۲}} \longrightarrow a^۲ = ۱۲$

$a^۲ = ۱۶+۴-۲\times۴\times\frac{\sqrt۳}{۲}\times۲$

$a^۲ = \frac{۱۶}{۹}+\frac{۳۴}{۲۴}-\cancel{۲}\times\frac{۵}{۳}\times۹\times\frac{۱}{\cancel{۲}} \longrightarrow a^۲ = \frac{۲۵}{۹}$

$\boxed{a^۲ = ۲۰-۸\sqrt۳}$