نام و نام خانوادگی .....لیلی..صبا..حبابی..... پاسخنامه تشریحی تکلیف شماره .....۱۳..... کلاس ...سه..انسانی...دوازدهم

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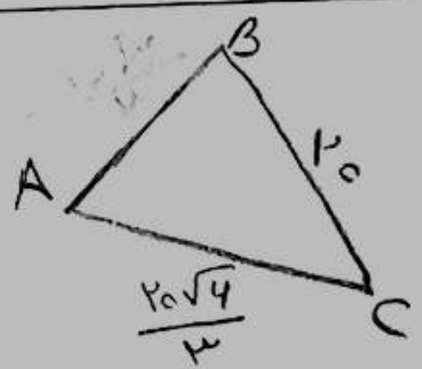

$\hat{B}+\hat{C}=120 \Rightarrow \hat{B}=120-\hat{C} \Rightarrow A=60$

$\frac{BC}{\sin A}=\frac{AC}{\sin B} \Rightarrow 20\sin B=\frac{20\sqrt{6}}{3}\sin 60 \Rightarrow \sin B=\frac{\sqrt{18}}{6}=\frac{3\sqrt{2}}{6}=\frac{\sqrt{2}}{2}$

$\Rightarrow \boxed{B=45} \quad \boxed{C=75}$ ✓ ✓ ۱

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$A'=45 \qquad \frac{CP}{\sin 45}=\frac{AC}{\sin 60} \Rightarrow \frac{2\sqrt{2}}{\frac{\sqrt{2}}{2}}=\frac{AC}{\frac{\sqrt{3}}{2}} \Rightarrow AC=2\sqrt{3}$

$\frac{AC}{\sin B_{60}}=\frac{x}{\sin 60} \Rightarrow \frac{2\sqrt{3}}{1}=\frac{x}{\frac{\sqrt{3}}{2}} \Rightarrow \boxed{x=3}$ ✓

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$\frac{c}{\sin C}=\frac{b}{\sin B} \Rightarrow \frac{\sin C}{\sin B}=\frac{c}{b}=\frac{c}{b^2-2} \Rightarrow b^2-2=b \Rightarrow b^2-b-2=0$

$\Rightarrow (b-2)(b+1)=0 \begin{cases} b=-1 \times \\ \boxed{b=2\sqrt{}} \end{cases}$ ✓

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$ac^2=BC^2+AB^2-2AB\cdot BC\cdot\cos B \Rightarrow 13^2=21^2+20^2-2\times20\times21\times\cos B \Rightarrow$

$169=400+441-840\cos B \Rightarrow 840\cos B=672 \Rightarrow \cos B=\frac{4}{5} \Rightarrow \sin^2 B+\cos^2 B=1$

$\Rightarrow \sin^2 B=1-\frac{16}{25}=\frac{9}{25} \Rightarrow \boxed{\sin B=\frac{3}{5}}$ ✓

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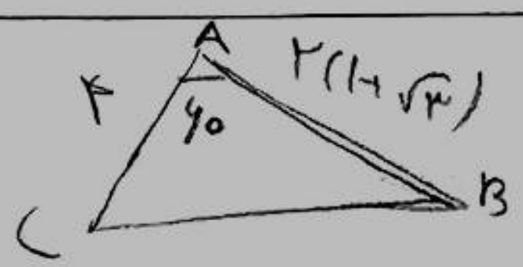

$a^2=4^2+(2(1+\sqrt{3}))^2-2\times4\times2(1+\sqrt{3})\cdot\cos 60$

$\Rightarrow a^2=16+16+8\sqrt{3}-16-16\sqrt{3}\cdot\frac{\sqrt{3}}{2} \Rightarrow a^2=16+8\sqrt{3}-24=$

$8\sqrt{3}-8$

$a=\sqrt{8\sqrt{3}-8}$

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$a^2=(2+2\sqrt{3})^2+(4)^2-2\times4\times\frac{1}{2}(2+2\sqrt{3})$

$a^2=4+12+8\sqrt{3}+16-8-8\sqrt{3} \rightarrow a^2=24 \rightarrow a=2\sqrt{6}$

$\frac{2\sqrt{6}}{\sin 60}=\frac{4}{\sin B} \rightarrow \sin B=\frac{\sqrt{2}}{2} \rightarrow \hat{B}=45^\circ, \hat{C}=75^\circ$

لیلی صباحی

مثلث کوچک: $a^2 = c^2 + b^2 - 2bc\cos\alpha \Rightarrow 4 = 1 + 4 - 4\cos\alpha \Rightarrow 4\cos\alpha = 1 \Rightarrow \cos\alpha = \frac{1}{4}$

مثلث بزرگ: $a^2 = d^2 + e^2 - 2de\cos\alpha \Rightarrow a^2 = 36 + 16 - 48 \times \frac{1}{4} = 40 \Rightarrow a = \sqrt{40} = \boxed{2\sqrt{10}}$ ✓

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$\frac{1}{2} b \cdot c \times \sin A = \frac{1}{2} \times A \times 8 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$ ✓ (ب)

الف) $a^2 = b^2 + c^2 - 2bc\cos\hat{A} \Rightarrow a^2 = 8^2 + 1^2 - 2(8)(1)(\cos 60^\circ)$

$= 89 - 40 = 49 \Rightarrow \boxed{a = 7}$ ✓

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$(b+c)^2 = b^2 + 2bc + c^2 \Rightarrow (b+c)^2 - a^2 = b^2 + 2bc + c^2 - a^2$, $a^2 = b^2 + c^2 - 2bc\cos A$

$\Rightarrow b^2 + 2bc + c^2 - b^2 - c^2 + 2bc\cos A = 2bc + 2bc\cos A = 2bc(1 + \cos A)$

$\Rightarrow \frac{(b+c)^2 - a^2}{bc(\cos A + 1)} = \frac{2bc(1+\cos A)}{bc(\cos A + 1)} = \boxed{2}$ ✓

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$a^2 = \frac{a^3 + b^3 - c^3}{a + b - c} \Rightarrow a^3 + a^2 b - a^2 c = a^3 + b^3 - c^3 \Rightarrow a^2 b - a^2 c = b^3 - c^3$

$\Rightarrow a^2(b-c) = b^3 - c^3 \Rightarrow a^2(b-c) = (b-c)(b^2 + bc + c^2)$ ($b - c \neq 0$) $\Rightarrow a^2 = b^2 + bc + c^2$

$b^2 + bc + c^2 = b^2 + c^2 - 2bc\cos A \Rightarrow bc = -2bc\cos A \Rightarrow \boxed{\cos A = -\frac{1}{2}}$ ✓

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$\frac{1}{2}(3 - \cos\theta)(1 + 3\cos\theta) \times \sin 90^\circ = 2 \Rightarrow 3 + 9\cos\theta - \cos\theta - 3\cos^2\theta = 8$

$\Rightarrow 3\cos^2\theta - 8\cos\theta + 5 = 0 \Rightarrow \cos\theta = 1 \checkmark \quad \frac{5}{3}\cos\theta = \frac{5}{3}$ ✗

$AB = 2$, $AC = 4$ $\Rightarrow a^2 = 2^2 + 4^2 - 2 \times 2 \times 4 \times \cos 30^\circ = 16 + 4 - 16 \times \frac{\sqrt{3}}{2} = \boxed{20 - 8\sqrt{3}}$ ✓

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