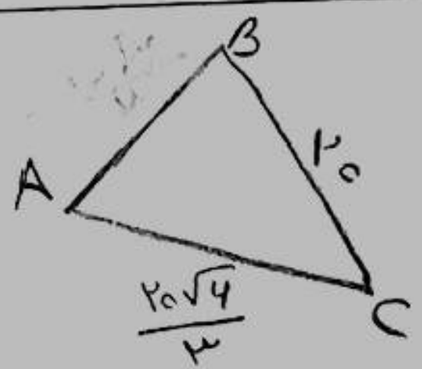
نام و نام خانوادگی .....لیلی..صبا..حبابی..... پاسخنامه تشریحی تکلیف شماره .....۱۳..... کلاس ...سه..انسانی..دوازدهم



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

$\frac{BC}{\sin A}=\frac{AC}{\sin B} \Rightarrow 20\sin B=\frac{20\sqrt{6}}{3}\sin 60 \Rightarrow \sin B=\frac{\sqrt{18}}{4}=\frac{3\sqrt{2}}{4}=\frac{\sqrt{2}}{3}$

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

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

$\frac{AC}{\sin B_{60}}=\frac{x}{\sin 60} \Rightarrow \frac{2\sqrt{3}}{1}=\frac{x}{\frac{\sqrt{3}}{2}} \Rightarrow \boxed{x=3}$ ۲

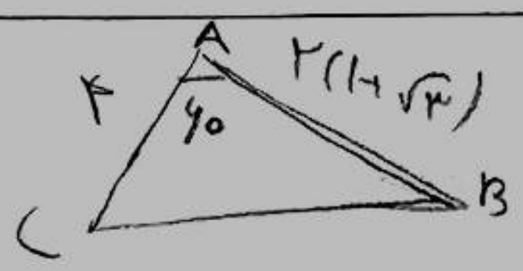
$\frac{c}{\sin C}=\frac{b}{\sin B} \Rightarrow \frac{\sin C}{\sin B}=\frac{c}{b}=\frac{c}{b^2-2} \Rightarrow b^2-2=b \Rightarrow b^2-b-2=0$

$\Rightarrow (b-2)(b+1)=0 \begin{cases} b=-1 \times \\ \boxed{b=2\sqrt{}} \end{cases}$ ۳

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

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

$\Rightarrow \sin^2 B=1-\frac{16}{25}=\frac{9}{25} \Rightarrow \boxed{\sin B=\frac{3}{5}}$ ۴



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

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

$8\sqrt{3}-8$

$a=\sqrt{8\sqrt{3}-8}$ ۵

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: $a^2 = d^2 + e^2 - 2de\cos\alpha \Rightarrow a^2 = 36 + 16 - 48 \times \frac{1}{4} = 40 \Rightarrow a = \sqrt{40} = \boxed{2\sqrt{10}}$ — ۶

$\frac{1}{2} b \cdot c \times \sin A = \frac{1}{2} \times 4 \times 10 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$ — ب

الف $a^2 = b^2 + c^2 - 2bc\cos\hat{A} \Rightarrow a^2 = 10^2 + 8^2 - 2(10)(8)(\cos 60)$ — ۲

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

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

$\Rightarrow b^2 + 2bc + c^2 - b^2 - c^2 + 2bc\cos A = 2bc + 2bc\cos A = 2bc(1 + \cos A)$ — ۱

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

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

$\Rightarrow a^2(b-c) = b^3 - c^3 \Rightarrow a^2(b-c) = (b-c)(b^2 + bc + c^2) \overset{b-c\neq 0}{\Rightarrow} a^2 = b^2 + bc + c^2$ — ۹

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

$\frac{1}{2}(3 - \cos\theta)(1 + 3\cos\theta) \times \sin 90 = 2 \Rightarrow 3 + 9\cos\theta - \cos\theta - 3\cos^2\theta = 4$

$\Rightarrow 3\cos^2\theta - 8\cos\theta + 1 = 0 \Rightarrow \cos\theta = 1 \checkmark \quad \cos\theta = \frac{1}{3} \times$ — ۱۰

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