نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۱۳ کلاس .....

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$\hat{B}+\hat{C}+\hat{A}=180 \Rightarrow \underbrace{\hat{B}+\hat{C}}_{120}+\hat{A}=180 \Rightarrow \hat{A}=60^\circ$

$\frac{AC}{\sin B}=\frac{BC}{\sin A}$ (۲)

$\frac{30\sqrt{6}}{2\sin B}=\frac{30}{\frac{\sqrt{3}}{2}} \quad \sin B=\frac{30\sqrt{2}}{60}=\frac{\sqrt{2}}{2} \Rightarrow \hat{B}=45^\circ$ ✓ $\Rightarrow \hat{C}=75^\circ$ ✓ ($B+C<120$)

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$\sin 60^\circ=\frac{x}{AC}=\frac{\sqrt{3}}{2} \Rightarrow AC=\frac{2x}{\sqrt{3}}$

$\hat{A}+\underbrace{\hat{C}+\hat{B}}_{135}=180 \quad A=45^\circ$

$\frac{AC}{\sin D}=\frac{CD}{\sin A} \quad \frac{\frac{2x}{\sqrt{3}}}{\frac{\sqrt{6}}{2}}=\frac{2\sqrt{2}}{\frac{\sqrt{2}}{2}} \Rightarrow x=3$ ✓ (۲)

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$\frac{\sin\hat{C}}{c}=\frac{\sin\hat{B}}{b} \Rightarrow \frac{\sin C}{\sin B}=\frac{c}{b} \quad (b^2-2)\frac{c}{b}=c$ (۲)

$b^2-2=b \quad b^2-b-2=0 \quad (b-2)(b+1)=0 \quad b=2$ ✓ ($b=-1$ ق ق ق)

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$S=\sqrt{p(p-a)(p-b)(p-c)} \quad p=\frac{21+20+13}{2}=27$ (۲)

$S=\sqrt{27\times 7\times 4\times 14}=9\times 7\times 2$

$S=\frac{1}{2}\times AB\times BC\times\sin B=\frac{1}{2}\times 20\times 21\times\sin B=9\times 7\times 2 \Rightarrow \sin B=\frac{3}{5}$ ✓

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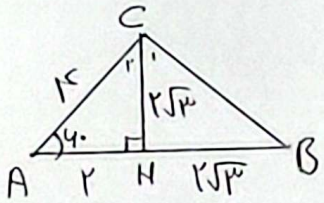

$AH=4\times\cos 60^\circ=2 \quad AB=4+2\sqrt{3} \Rightarrow BH=2\sqrt{3}$ (۲)

$CH=2\times\tan 60^\circ=2\sqrt{3}$

$CH=BH \Rightarrow \hat{C}_1=\hat{B}=45^\circ$ ✓ $\Rightarrow \hat{C}=75^\circ$ ✓

$\hat{C}_2=30^\circ$

$BC^2=CH^2+BH^2=24 \Rightarrow a=2\sqrt{6}$ ✓

۶

$BC^2 = AC^2 + AB^2 - 2 \times AC \times AB \times \cos\alpha$

$4 = 4 + 1 - 2 \times 2 \times 1 \times \cos\alpha$

$\cos\alpha = \frac{1}{4}$ ✓

$DE^2 = AD^2 + AE^2 - 2AD \times AE \times \cos\alpha$

$DE^2 = 14 + 49 - 2 \times 4 \times 7 \times \frac{1}{4}$

$DE^2 = 45 \Rightarrow DE = 3\sqrt{5}$ ✓

(۲)

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الف) $49 + 25 - 2 \times 8 \times 5 \times \frac{1}{2} = BC^2 \Rightarrow BC = 7$ ✓

ب) $S = \frac{1}{2} \times \frac{\sqrt{3}}{2} \times 8 \times 5 = 10\sqrt{3}$ ✓

(۲)

۸

$a^2 = b^2 + c^2 - 2bc\cos A$

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

(۲)

۹

$a^3 + b^3 - c^3 = a^3 + a^2 b - a^2 c$

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

$b^2 + bc + c^2 = a^2$

$a^2 = b^2 + c^2 + bc$

$a^2 = b^2 + c^2 - 2bc\cos A$

$bc = -2bc\cos A$

$\cos A = -\frac{1}{2} \Rightarrow A = 120^\circ$ ✓

(۲)

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$\frac{1}{2} \times \sin^2\theta \,(3 - \cos\theta)(1 + 3\cos\theta) = 2$

$(3 - \cos\theta)(1 + 3\cos\theta) = 8$

واضح است $\Rightarrow \cos\theta = 1 \Rightarrow AB = 2 \quad AC = 4$

$a^2 = 4 + 16 - 2 \times 4 \times 2 \times \frac{\sqrt{3}}{2}$

$a^2 = 20 - 8\sqrt{3}$ ✓

(۲)