نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۱۴ کلاس .....

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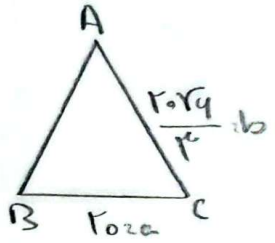

$\frac{b}{\sin\hat{B}} = \frac{c}{\sin\hat{C}} = \frac{a}{\sin\hat{A}}$

$\hat{A}+\hat{B}+\hat{C}=180^\circ$

$\hat{C}=60^\circ$

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

$c=75^\circ$

$\frac{25}{\sin 60^\circ} = \frac{\frac{20\sqrt{6}}{2}}{\sin\hat{B}} \rightarrow \sin\hat{B} = \frac{10\sqrt{2}}{50\sqrt{2}} = \frac{\sqrt{2}}{2}$

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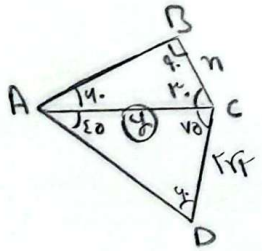

$\frac{2\sqrt{6}}{\sin 45^\circ} = \frac{y}{\sin 60^\circ} \rightarrow y = 4 \times \frac{1}{2}$ (۱)

$\frac{2}{1\sin 60^\circ} = \frac{n}{\sin 45^\circ \frac{1}{2}} \rightarrow n=1$

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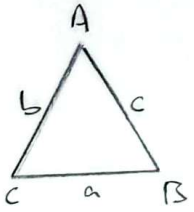

$(b^2-2)\frac{\sin\hat{C}}{\sin\hat{B}} = c \rightarrow \frac{\sin\hat{C}}{c} = \frac{\sin\hat{B}}{b^2-2} = \frac{\sin\hat{B}}{b}$

$b^2-2=b \rightarrow b^2-b-2=0$ $\begin{cases} b=-1 \times \\ b=2 \end{cases}$

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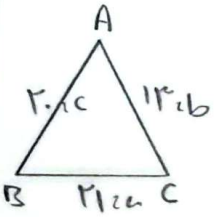
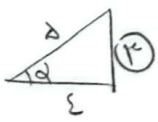


$b^2 = a^2 + c^2 - 2ac\cos\hat{B}$

$12^2 = 21^2 + 20^2 - 2\times(20)(21)\cos\hat{B}$

$\cos\hat{B} = \frac{4}{5}$



(۱) $\sin\hat{B} = \frac{3}{5}$

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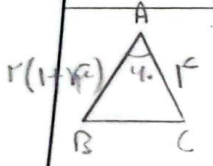

$a^2 = 4^2 + 4(1+\sqrt{3})^2 - 2\times4\times2(1+\sqrt{3})\cos 60^\circ$

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

$\rightarrow a = 2\sqrt{6}$

$\frac{\frac{2\sqrt{2}}{2}}{\sin 60^\circ} = \frac{2\sqrt{6}}{\sin\hat{B}}$

$\sin\hat{B} = \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{2}$

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

$C = 180^\circ - (45^\circ + 60^\circ) = 75^\circ$

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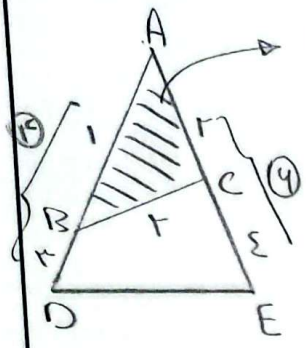

$r^2 = r^2 + 1^2 - 2 \times 2 \times 1 \times \cos\hat{A} \rightarrow \cos\hat{A} = \frac{1}{4}$

$DE^2 = 9^2 + 16^2 - 2 \times 9 \times 16 \times \frac{1}{4} \times \cos\hat{A}$

$DE = \sqrt{160} = \boxed{4\sqrt{10}}$

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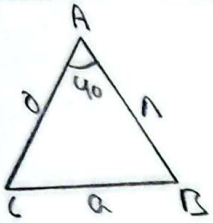

$a^2 = 8^2 + 5^2 - 2 \times 8 \times 5 \times \frac{1}{2} \cos 40$

$\boxed{a = 7}$

$S_{\triangle ABC} = \frac{1}{2} b c \sin\hat{A}$

$\frac{1}{2} \times 8 \times 5 \times \frac{\sqrt{3}}{2} = \boxed{10\sqrt{3}}$

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

$(b+c)^2 = b^2 + c^2 + 2bc$

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

$= \boxed{2}$

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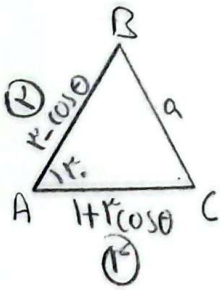

$2 = \frac{1}{2}(2 - \cos\theta)(1 + 2\cos\theta)\sin 120$

$(2 - \cos\theta)(1 + 2\cos\theta) = 8$

$2 - \cos\theta + 9\cos\theta - 2\cos^2\theta = 8$

$2\cos^2\theta - 8\cos\theta + 6 = 0$

$\cos\theta = 1 \quad \checkmark \quad \cos\theta = 3$ ✗

$a^2 = 2^2 + 4^2 - 2 \times 2 \times 4 \times \frac{1}{2}$

$\boxed{a^2 = 28 - 8\sqrt{3}}$