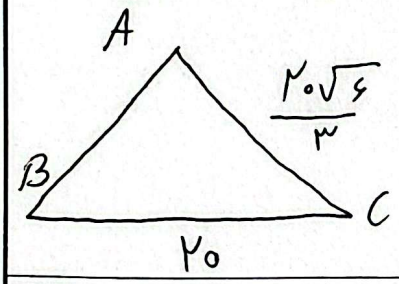
نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۱۳ ..... کلاس دوازدهم A .....

$B+C=120^\circ \Rightarrow A=60^\circ$



$\frac{BC}{\sin A}=\frac{AC}{\sin B} \Rightarrow \frac{۲۰}{\frac{\sqrt{۳}}{۲}}=\frac{\frac{۲۰\sqrt{۶}}{۳}}{\sin B}$

$\Rightarrow \sin B=\frac{\sqrt{۱۸}}{۶}=\frac{۳\sqrt{۲}}{۶}=\frac{\sqrt{۲}}{۲} \Rightarrow B=۴۵^\circ$ ۱

$A=۱۸۰-(۹۰+۷۵)=۴۵$ $\quad \frac{CD}{\sin A}=\frac{AC}{\sin ۹۰^\circ} \Rightarrow \frac{۲\sqrt{۲}}{\sin ۴۵}=\frac{AC}{\sin ۹۰^\circ}$

$\Rightarrow \frac{۲\sqrt{۲}}{\frac{\sqrt{۲}}{۲}}=\frac{AC}{\frac{\sqrt{۳}}{۲}} \Rightarrow \frac{۲AC}{\sqrt{۲}}=۴ \Rightarrow AC=۲\sqrt{۲}$ ۲

$\frac{x}{\sin ۶۰^\circ}=\frac{۲\sqrt{۲}}{\sin ۹۰^\circ} \Rightarrow \frac{x}{\frac{\sqrt{۳}}{۲}}=\frac{۲\sqrt{۲}}{۱} \Rightarrow x=\sqrt{۶}$

$\frac{c}{\sin C}=\frac{b}{\sin B}=\frac{a}{\sin A}=k \Rightarrow c=k\sin C \Rightarrow (b^۲-۲)\frac{\sin C}{\sin B}=k\sin C$

$\Rightarrow \frac{b^۲-۲}{\sin B}=k \Rightarrow b^۲-۲=k\sin B \Rightarrow b^۲-b-۲=۰ \Rightarrow (b-۲)(b+۱)=۰$ ۳

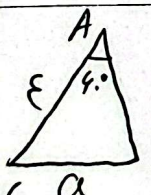
$\Rightarrow \boxed{b=۲ \checkmark}$ $\quad b=-۱ \times$

$AC^۲=BC^۲+AB^۲-۲BC.AB.\cos B$

$۱۶۹=۴۴۱+۴۰۰-۲(۴۲۰\cos B) \Rightarrow -۶۷۲=-۸۴۰\cos B$ ۴

$\Rightarrow \cos B=۰/۸ \Rightarrow \frac{۶۴}{۱۰۰}+\sin^۲ B=۱ \Rightarrow \sin^۲ B=\frac{۳۶}{۱۰۰} \Rightarrow \sin B=\pm\frac{۶}{۱۰}$

چون $B<۹۰^\circ$ غ ق ق



۲+۲√۳

الف) $a^۲=b^۲+c^۲-۲bc\cos\hat{A}=۱۶+۴+۸\sqrt{۳}+۱۲-۲(۴)(۲+۲\sqrt{۳})$ ½

$\Rightarrow ۱۶+۱۶+۸\sqrt{۳}-۸-۸\sqrt{۳} \Rightarrow ۲۴=a^۲ \Rightarrow a=\sqrt{۲۴}=۲\sqrt{۶}$ ۵

ب) $\frac{a}{\sin ۶۰^\circ}=\frac{۴}{\sin B} \Rightarrow \frac{۲\sqrt{۶}}{\frac{\sqrt{۳}}{۲}}=\frac{۴}{\sin B} \Rightarrow \sin B=\frac{۱}{\sqrt{۲}}$

$\Rightarrow \sin B=\frac{\sqrt{۲}}{۲} \Rightarrow B=۴۵^\circ$

$BC^2 = AC^2 + AB^2 - 2AC \times AB \times \cos\alpha \Rightarrow 5 = 4 + 1 - 2(2\times1\times\cos\alpha)$

$\Rightarrow -1 = -4\cos\alpha \Rightarrow \cos\alpha = \frac{1}{4}$

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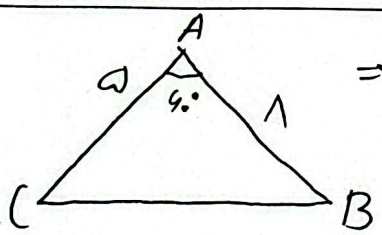
$DE^2 = AE^2 + AD^2 - 2AE \times AD \times \cos\alpha = 36 + 16 - 2(6\times4\times\frac{1}{4})$

$\Rightarrow DE^2 = 52 - 12 = 40 \rightarrow DE = \sqrt{40} = \boxed{2\sqrt{10}}$



$\Rightarrow BC^2 = (8)^2 + (5)^2 - 2\times5\times8\times\cos60^\circ$

$\Rightarrow BC^2 = 64 + 25 - 40 \Rightarrow BC^2 = 49 \rightarrow \boxed{BC = 7}$ (الف)

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ب) $S = \frac{1}{2}\times8\times5\sin60^\circ = \frac{40\sqrt{3}}{4} = \boxed{10\sqrt{3}}$

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

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

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$\Rightarrow \frac{2bc(1+\cos\hat{A})}{bc(\cos\hat{A}+1)} = \boxed{2}$

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

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

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$\Rightarrow (b-c)(b^2+bc+c^2-a^2) = 0 \xrightarrow[b-c\neq0]{b\neq c} b^2+bc+c^2-a^2 = 0 \Rightarrow b^2+bc+c^2 = a^2$

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

$\rightarrow A = 120^\circ$

$S = 2 \Rightarrow \frac{1}{2}\times(1+2\cos\theta)(2-\cos\theta)\times\frac{1}{2} = 2 \Rightarrow -2\cos^2\theta + \cos\theta + 2 = 1$

$\sin30^\circ$

$\Rightarrow -2\cos^2\theta + \cos\theta - 1 = 0 \rightarrow \cos^2\theta + \cos\theta + 1 = 0 \rightarrow (\cos\theta+1)(\cos\theta+1) = 0$ ۱۰

$\Rightarrow \cos\theta = \frac{1}{2}$ مرفوض

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

$\Rightarrow a^2 = 4 + 16 - 8\sqrt{3} \Rightarrow a^2 = 20 - 8\sqrt{3} \Rightarrow \boxed{a = \sqrt{20-8\sqrt{3}}}$