نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۱۲ ..... کلاس .....

۱۹۵

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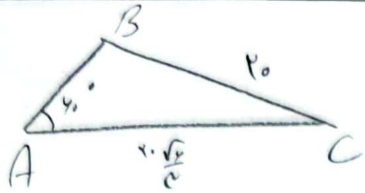


$\frac{BC}{\sin\hat{A}} = \frac{AC}{\sin\hat{B}} \rightarrow \frac{۲۰}{\frac{\sqrt{۶}}{۲}} = \frac{۲۰\sqrt{۶}}{c} \Big/ \sin\hat{B}$

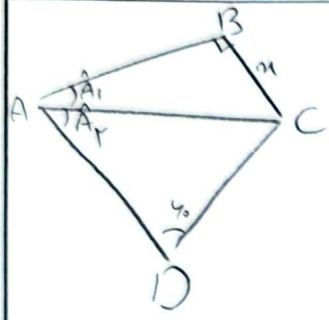
$\sin\hat{B} = \frac{\sqrt{۲}}{۲} \times ۲۰\frac{\sqrt{۶}}{c} \times \frac{۱}{۲۰} = \frac{\sqrt{۲}}{۲}$

$\hat{B} + C = ۱۸۰ - ۶۰ = ۱۲۰ \rightarrow A = ۶۰°$ ✓ (۲)

$\hat{B} \rightarrow ۴۵°$ ✓

$C = ۱۲۰ - ۴۵ = ۷۵°$ ✓

۲



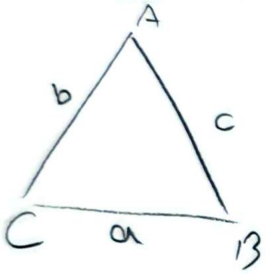
$BC = AC \times \sin\hat{A}_1 \rightarrow m = AC \times \frac{\sqrt{۶}}{۲} \rightarrow AC = \frac{۲m}{\sqrt{۳}}$

$A_۲ + C + D = ۱۸۰ \rightarrow A_۲ + ۷۵ + ۶۰ = ۱۸۰$

$A_۲ = ۴۵°$ (۲)

$\frac{CD}{\sin A_۲} = \frac{AC}{\sin D} \rightarrow \frac{۲\sqrt{۲}}{\frac{\sqrt{۲}}{۲}} = \frac{\frac{۲m}{\sqrt{۶}}}{\frac{\sqrt{۶}}{۲}} \rightarrow m = ۲$ ✓

۳



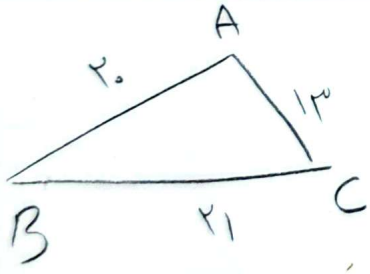
$\frac{c}{\sin\hat{C}} = \frac{b}{\sin\hat{B}} \rightarrow c = b\frac{\sin\hat{C}}{\sin\hat{B}}$

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

$b = b^۲ - ۲ \rightarrow b^۲ - b - ۲ = ۰$

$(b-۲)(b+۱) = ۰ \xrightarrow{b>۰} b = ۲$ ✓

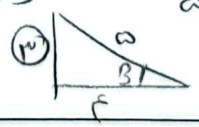
۴



$AC^۲ = AB^۲ + CB^۲ - ۲AB \times CB \times \cos\hat{B}$

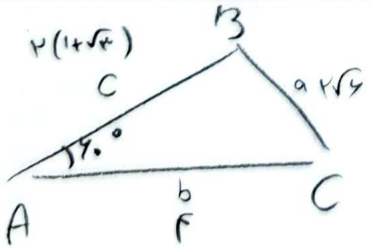
$۱۴۹ = ۴۰۰ + ۴۴۱ - ۲ \times ۲۰ \times ۲۱ \times \cos\hat{B}$ (۲)

$\cos\hat{B} = ۰/۸ = \frac{۴}{۵}$ ✓ $\sin^۲\hat{B} = ۱ - \cos^۲\hat{B}$



$\sin\hat{B} = \frac{۳}{۵} = ۰/۶$ ✓

۵



(نصف) $a^۲ = b^۲ + C^۲ - ۲bC\cos\hat{A}$

$a^۲ = ۱۶ + ۴(۴ + ۲\sqrt{۳}) - ۲ \times ۴ \times ۲(۱+\sqrt{۳}) \times \frac{۱}{۲}$ (۲)

$\rightarrow a = \sqrt{۴۸} = ۴\sqrt{۳}$ ✓

$\rightarrow$) $\frac{c}{\sin\hat{C}} = \frac{b}{\sin\hat{B}} = \frac{a}{\sin\hat{A}} \rightarrow \frac{۲(۱+\sqrt{۳})}{\sin\hat{C}} = \frac{۴}{\sin\hat{B}} = \frac{۴\sqrt{۶}}{\frac{\sqrt{۳}}{۲}}$ (۵)

$\rightarrow \sin\hat{B} = \frac{\sqrt{۲}}{۲} \rightarrow ۴۵°$ ✓ $C = ۱۸۰ - ۶۰ - ۴۵ = ۷۵°$ ✓

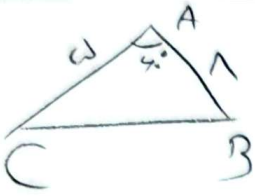
$BC^2 = AB^2 + AC^2 - 2AB \times AC \times \cos\alpha \rightarrow 4 = 1 + 4 - (2 \times 1 \times 2 \times \cos\alpha)$

$\rightarrow \cos\alpha = \frac{1}{4}$ ✓

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

$\rightarrow 52 - 12 = 40$ $\quad DE = \sqrt{40} = 2\sqrt{10}$ ✓

۶ (۲)



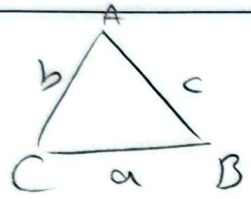
$BC^2 = AB^2 + AC^2 - 2 \times AB \times AC \times \cos 60°$

$BC^2 = 9 + 25 - \left(2 \times 3 \times 8 \times \frac{1}{2}\right) = 49$

$BC = \sqrt{49} = 7$ ✓

$\rightarrow S = \frac{1}{2} \times AB \times AC \times \sin 60° \rightarrow \frac{1}{2} \times 8 \times 5 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$ ✓

۷ (۲)

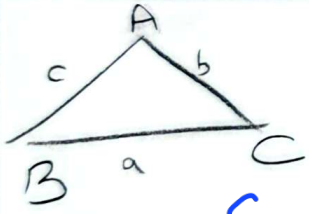


$\frac{(b+c)^2 - a}{bc(\cos\hat{A}+1)} \rightarrow \frac{2bc(\cos\hat{A}+1)}{bc(\cos\hat{A}+1)} = 2$ ✓

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

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

۸ (۲)



$\frac{a^3 + b^3 - c^3}{a+b-c} = a^2 \rightarrow a^3 + b^3 - c^3 = a^3 + a^2b - a^2c$ (۱٫۵)

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

$a^2 = b^2 + c^2 - 2bc\cos\hat{A} \rightarrow \cos\hat{A} = \frac{1}{2}$ $\quad \hat{A} = 120°$

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

۹

$S_{\hat{ABC}} = \frac{1}{2} AB \times AC \times \sin\hat{A} \rightarrow 2 = \frac{1}{2} \times \frac{1}{2} \times \frac{(3 - \cos\theta)(1 + 3\cos\theta)}{3 + 9\cos\theta - \cos\theta - 3\cos^2\theta}$

$\rightarrow -3\cos^2\theta + 8\cos\theta + 3 = 8 \rightarrow 3\cos^2\theta - 8\cos\theta + 5 = 0 \rightarrow \cos\theta = 1$

$3 - 3\cos\theta = 2$ $\quad 0 < \theta < 90°$

$\rightarrow 1 + 3\cos\theta = 4$ $\quad \cos\theta = \frac{c}{a} = \frac{a}{3} \times \frac{\sqrt{5}}{3}$

$a^2 = AB^2 + AC^2 - 2AB \times AC \times \cos A$

$\rightarrow a^2 = 4 + 9 - 12 \times 4 \times \frac{\sqrt{5}}{6} \rightarrow a^2 = 20 - 8\sqrt{5}$ ✓

۱۰ (۲)