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

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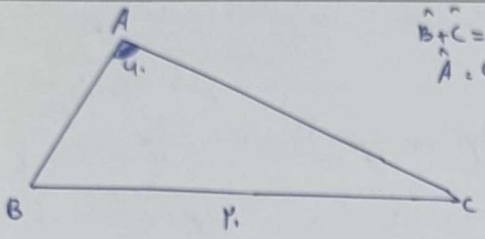


$\hat{B}+\hat{C}=۱۲۰$

$\hat{A}=۷۰$

$\frac{BC}{\sin ۷۰}=\frac{AC}{\sin \hat{B}}=\frac{AB}{\sin \hat{C}}=k$

$\frac{۲۰}{\frac{\sqrt{۳}}{۲}}=\frac{۶۰}{\sqrt{۳}}=\frac{۶۰\sqrt{۳}}{۳}$

$AC=\sin \hat{B}\times\frac{۶۰\sqrt{۳}}{۳}=\frac{۳۰\sqrt{۷}}{۳}$ $\quad \sin\hat{B}=\frac{\sqrt{۳}}{۲}$

$\begin{cases} B=۶۰ \\ A=۷۰ \\ C=۵۰ \end{cases}$

۲

$\hat{A}_۲=۱۸۰-(۵۰+۷۰)=۶۰$

$\frac{۲\sqrt{۲}}{\sin ۶۰}=\frac{AC}{\sin ۷۰}$

$\frac{۲\sqrt{۲}}{\frac{\sqrt{۳}}{۲}}=۶$ $\quad AC=\frac{\sqrt{۳}}{۲}\times ۶=۲\sqrt{۳}$

$BC=AC\times\sin ۷۰=۲\sqrt{۳}\times\frac{\sqrt{۳}}{۲}=۳$

x

۳

$\frac{c}{\sin c}=\frac{b}{\sin B}=k$

$\frac{b^۲-۲}{\sin B}=\frac{c}{\sin C}=\frac{b}{\sin B}$

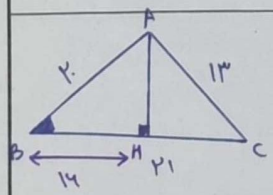
$b^۲-۲=b$

$b^۲-b-۲=۰$

$(b-۲)(b+۱)=۰$

$b=\begin{cases} -۱ \text{ غ ق ق} \\ +۲ \checkmark \end{cases}$

۴



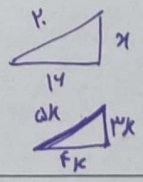
$۱۳^۲=۲۱^۲+۲۰^۲-۲(۲۱)(۲۰)\cos B$

$۱۶۹=۴۴۱+۴۰۰-۸۴۰\cos B$

$\frac{۹\sqrt{۲}}{۸۴۰}=\frac{۸}{۱۰}=\cos B$

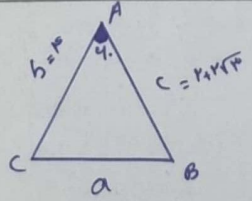
$\frac{BH}{۲۰}=\frac{۸}{۱۰}$

$BH=۱۶$



$x=۱۲$ cm

۵



$a^۲=b^۲+c^۲-۲bc\cos\hat{A}$

$a^۲=۱۶+۴+۸\sqrt{۳}+۱۲-۲(۴)(۲+۲\sqrt{۳})\frac{۱}{۲}$

$a^۲=۳۲+۸\sqrt{۳}-۸-۸\sqrt{۳}=۲۴$ $\longrightarrow$ $a=\sqrt{۲۴}=۲\sqrt{۶}$

$\frac{a}{\sin A}=\frac{b}{\sin B}$ $\longrightarrow$ $\frac{۲\sqrt{۶}}{\frac{\sqrt{۳}}{۲}}=\frac{۲\sqrt{۳}\sqrt{۲}}{\frac{\sqrt{۳}}{۲}}=۴\sqrt{۲}$ $\quad \frac{۴}{\sin b}=۴\sqrt{۲}$ $\quad \sin B=\frac{۱}{\sqrt{۲}}=\frac{\sqrt{۲}}{۲}$

$\begin{cases} A=۷۰ \\ B=۴۵ \\ C=۶۵ \end{cases}$

۶

$BC^2 = (1)^2 + (2)^2 - 2(2)(1)\cos\alpha =$

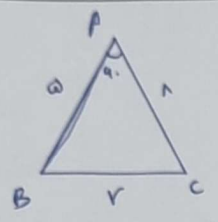
$1 + 4 - 4\cos\alpha = 4$

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

$DE^2 = 14 + 34 - 2(4)(9)\frac{1}{4}$

$14 + 34 - 18 = 48 + 34 = 80$

۷

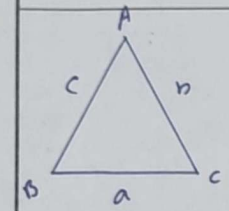


$BC^2 = 25 + 64 - 2(5)(8)\frac{1}{2} = 49$

$BC = 7$ ← این ضلع

$S = \frac{1}{2} \times 5 \times 8 \times \sin 60 = \frac{1}{2} \times 5 \times 8 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$

۸



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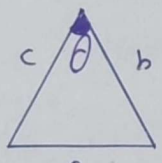


$a^3 + b^3 - c^3 = a^3 + a^2b - a^2c$

$b^3 - c^3 = a^2(b - c)$

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

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

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

$\cos\theta = -\frac{1}{2}$ ✓

$\theta = 120$

۱۰

$\cos\theta = x$ $\quad \sin 30 = \frac{1}{2}$

$\frac{1}{2}(3 - x)(1 + 3x)\left(\frac{1}{2}\right) = 2$

$(3 - x)(1 + 3x) = 8$

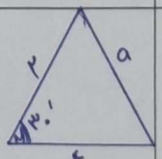
$-3x^2 + 8x - 5 = 0$

$x^2 + 8x + 15 = 0$

$(x + 3)(x + 5)$

$-3 \longrightarrow 1$ ✓

$-5 \longrightarrow \frac{5}{3}$ غ ق ق $-1 \le \cos\theta \le 1$



$a^2 = b^2 + c^2 - 2bc\cos 60$

$a^2 = 16 + 4 - 2(2)(4)\left(\frac{\sqrt{3}}{2}\right)$

$= 20 - 8\sqrt{3}$