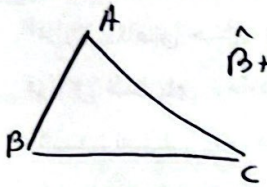
سارینا ستاره — تایپ ۱۳ — ۱۹٫۷۵ آفرین

①



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

$\frac{20}{\frac{\sqrt{3}}{2}}=\frac{20\sqrt{2}}{\sin\hat{B}} \Rightarrow \sin\hat{B}=\frac{10\sqrt{2}}{20}=\frac{\sqrt{2}}{2} \rightarrow \hat{B}=45^\circ$ یا 135°

$\hat{C}=75^\circ$

②

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

$\frac{2\sqrt{2}}{\frac{\sqrt{2}}{2}}=\frac{AC}{\frac{\sqrt{3}}{2}} \Rightarrow AC=2\sqrt{3}$

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

③

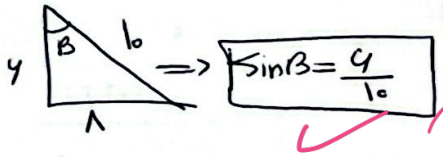
$\frac{\sin C}{c}=\frac{\sin B}{b^2-2} \Rightarrow b^2-2=b \Rightarrow b^2-b-2=0 \Rightarrow (b-2)(b+1) \rightarrow b=-1$

$b=2$

④

$49+40-2\times2\times7\times\cos B=19$

$80\cos B=70 \Rightarrow \cos B=\frac{70}{80}=\frac{7}{8}$



$\Rightarrow \sin B=\frac{\sqrt{15}}{8}$

⑤

$a^2=19+\underbrace{4(1+3+2\sqrt{3})}_{32+8\sqrt{3}}-\underbrace{2\times\frac{1}{2}\times4\times2\times(1+\sqrt{3})}_{-8-8\sqrt{3}}=24 \Rightarrow a=2\sqrt{6}$ (ق.ق)

$\frac{2\sqrt{6}}{\frac{\sqrt{3}}{2}}=\frac{4}{\sin B} \Rightarrow \sin B=\frac{\sqrt{2}}{2} \Rightarrow B=45^\circ$ یا 135° ← (ق.ق)

$C=75^\circ$

⑥

$\triangle ABC: 4=4+1-1\times2\times2\times\cos\alpha \Rightarrow 4\cos\alpha=1 \Rightarrow \cos\alpha=\frac{1}{4}$

$\triangle ADE: DE^2=\underbrace{19+15}_{36}-\underbrace{2\times4\times3\times\frac{1}{4}}_{12}=24 \Rightarrow DE=2\sqrt{6}$

$CB^2 = \frac{64+25}{89} - \frac{2\times\frac{1}{2}\times 5\times 8}{40} = 49 \Rightarrow CB = 7$ (الف)

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

$b^2+c^2+2bc\cos\alpha - a^2 = 2(1+\cos\alpha)bc$

$-b^2c^2+2bc\cos\alpha$

$(\cos\alpha+1)bc$

$a^2+b^2-c^2 = a^2+ba^2-ca^2$

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

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

$\Rightarrow -2\cos A = 1$

$\Rightarrow \cos A = -\frac{1}{2}$

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

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

$2\cos^2\theta-\cos\theta+6 = 0 \Rightarrow (2\cos\theta-5)(\cos\theta-1) = 0$

$\cos\theta = 1$

$\cos\theta = \frac{5}{2}$ غ ق ق

چرا ؟

$a^2 = 14+4-\frac{2\sqrt{3}}{2}\times\frac{1}{2}\times 2\times 4 = 20-2\sqrt{3}$

$14+4-(2\times\frac{\sqrt{3}}{2}\times 2\times 4) = 20-8\sqrt{3}$