

$$\hat{A} = 180^\circ - \hat{B} + \hat{C} \Rightarrow \hat{A} = 70^\circ \Rightarrow \frac{a}{\sin \hat{A}} = \frac{b}{\sin \hat{B}} \Rightarrow \frac{20}{\sin 70^\circ} = \frac{20\sqrt{3}}{\sin \hat{B}}$$

$$\Rightarrow \frac{20}{\frac{20\sqrt{3}}{3}} = \frac{20\sqrt{3}}{3 \sin \hat{B}} \Rightarrow 4 \sin \hat{B} \cdot \sqrt{3} = 3 \sin \hat{B} \cdot \frac{\sqrt{3}}{1}$$

$$\Rightarrow \hat{B} = 90^\circ \Rightarrow \hat{C} = 180^\circ - 70^\circ - 90^\circ = 20^\circ$$

$$\frac{n}{\sin 70^\circ} = \frac{AC}{\sin 90^\circ} \Rightarrow AC = \frac{20}{\sqrt{3}} \cdot \frac{2\sqrt{3}}{3} n$$

$$\hat{A}_r = 90^\circ \Rightarrow \frac{2\sqrt{2}}{\sin 90^\circ} = \frac{\frac{2\sqrt{3}}{3} n}{\sin 70^\circ} \Rightarrow \frac{2\sqrt{2}}{\frac{\sqrt{3}}{1}} = \frac{\frac{2\sqrt{3}}{3} n}{\frac{\sqrt{3}}{3}}$$

$$\Rightarrow \Sigma = \frac{2}{3} n \Rightarrow n = 12$$

$$\frac{\sin \hat{C}}{c} = \frac{\sin \hat{B}}{b} \Rightarrow \frac{\sin \hat{C}}{c} = \frac{\sin \hat{B}}{b^2 - 2} \Rightarrow \frac{\sin \hat{C}}{c} = \frac{\sin \hat{B}}{b}$$

فرض کنیم

$$\Rightarrow b^2 - 2 = b \Rightarrow b^2 - b - 2 = 0 \Rightarrow b = 2$$

$b = 1$ غلط

$$b^2 = a^2 + c^2 - 2ac \cos \hat{B} \Rightarrow 179 = 281 + 281 - 2(20)(20)(\cos \hat{B})$$

$$714 = \frac{2(20)(20)(\cos \hat{B})}{179} \Rightarrow \cos \hat{B} = \frac{714}{179} = 0.17$$

$$\sin^2 \hat{B} + \cos^2 \hat{B} = 1 \Rightarrow \sin^2 \hat{B} = 1 - 0.17^2 = 0.97 \Rightarrow \sin \hat{B} = 0.97$$

$$a^2 = b^2 + c^2 - 2bc \cos \hat{A} \Rightarrow a^2 = 17 + 17 + 2\sqrt{17} - 2(17)(20\sqrt{3}) \cos 70^\circ$$

$$\Rightarrow 2\sqrt{17} + 2\sqrt{17} - (17 + 17\sqrt{3}) \frac{1}{2} \Rightarrow 17 - 17\sqrt{3} = a^2 \Rightarrow \Sigma(2 - \sqrt{3}) = a^2$$

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$$a^2 = 7^2 + 20^2 - 2(7)(20)\cos 70^\circ \Rightarrow a^2 = 29 \Rightarrow a = \sqrt{29}$$

(ب)

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$$\frac{1}{2}ab\sin C \Rightarrow \frac{1}{2} \times 8 \times 12 \times \frac{\sqrt{3}}{2} = 10\sqrt{3} \text{ cm}^2$$

(ج)

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$$\frac{b^2 + c^2 + 2bc - b^2 - c^2 + 2bc\cos A}{bc(\cos A + 1)} \rightarrow \text{بازده صحت بررسی می شود}$$

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

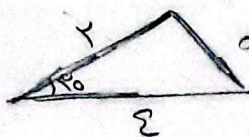
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$$\frac{1}{r} (r - \cos \theta) (1 + r \cos \theta) \sin 40^\circ = (-r \cos \theta + r + 1 \cos \theta) \times \frac{1}{r} \times r$$

$$-r \cos \theta + 1 \cos \theta + r = 1 \Rightarrow -r \cos \theta + 1 \cos \theta - 0.50 \Rightarrow (\cos \theta - 1)(-r \cos \theta + 0.50)$$

$$\Rightarrow \cos \theta = 1$$



$$\Rightarrow a^2 = 29 - 10\sqrt{3}$$