

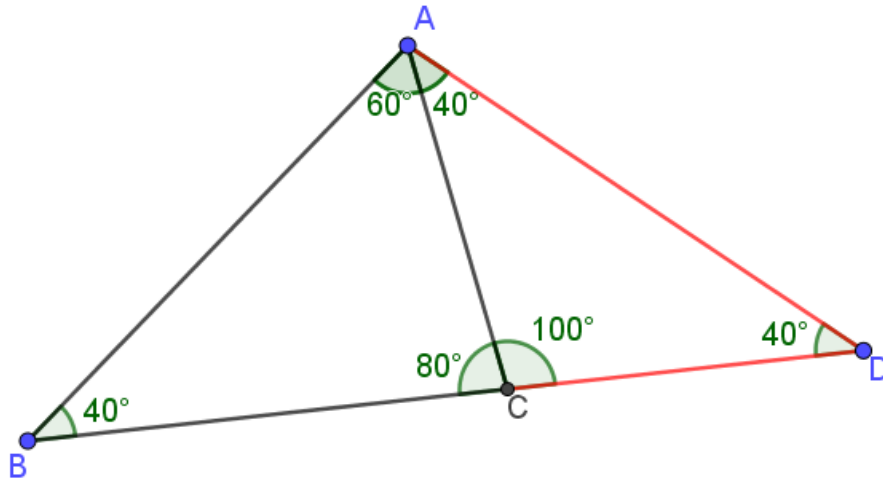
Cash Award Question of Sep-2025

In $\triangle ABC$, $\angle B : \angle A : \angle C = 2 : 3 : 4$.

Prove: $AB^2 = AC(AC + BC)$.

Question framed by
DR. M. RAJA CLIMAX, IRS
Asst. Commissioner of Customs & GST (Rtd),
Madurai, Tamil Nadu, India

Author's Solution -Sep 2025



Solution:

$$\angle B : \angle A : \angle C = 2 : 3 : 4 \quad (\text{given})$$

$$\Rightarrow \angle B = 40^\circ : \angle A = 60^\circ \text{ \& } \angle C = 80^\circ$$

Mark a point D on BC produced such that $AC = CD$.

$$\text{Now, } \angle CAD = \angle CDA = 40^\circ \quad (AC = CD)$$

$$\Rightarrow \angle ACD = 100^\circ$$

In $\triangle ABD$ & $\triangle CAD$ the angles are $100^\circ, 40^\circ$ & 40° . Both are similar.

$$\frac{AB}{AC} = \frac{BD}{AD}$$

$$\Rightarrow AB \times AD = AC \times BD$$

$$\Rightarrow AB^2 = AC(AC + BC) \quad [\because AB = AD \text{ \& } BD = BC + AC]$$

----- Proved

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