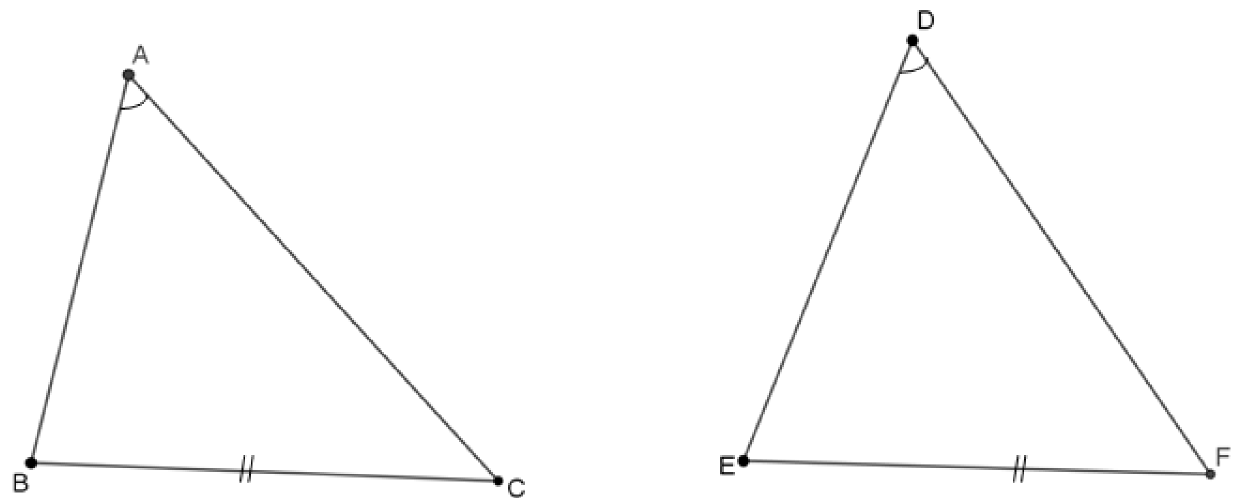
Cash Award Question for Feb-2026



In the picture, ABC & DEF are acute angled triangles. Given that BC=EF & $\angle A = \angle D$.

Prove that the areas of ΔABC & ΔDEF are in the ratio of $(AB^2 + AC^2 - BC^2)$: $(DE^2 + DF^2 - EF^2)$.

Question framed by
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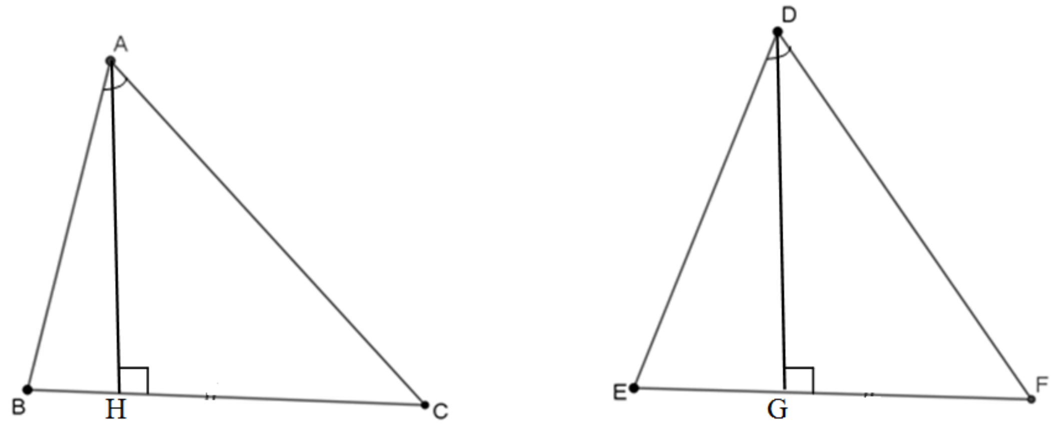
Author's Solution Feb-2026

Given :



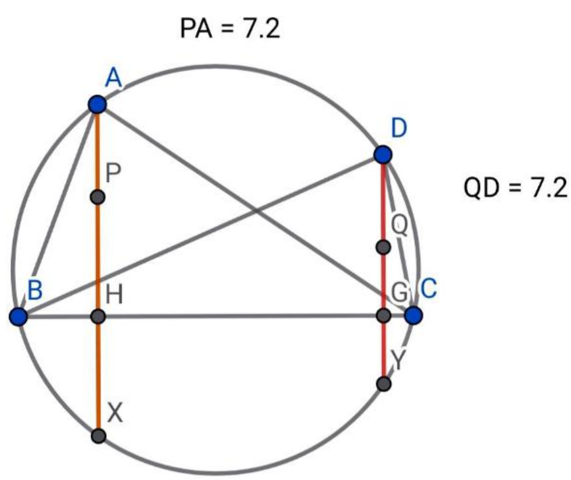
In ΔABC & ΔDEF, $\angle A = \angle D$, BC=EF

To prove : $\dfrac{Area\ \Delta ABC}{Area\ \Delta\ DEF} = \dfrac{AB^2+AC^2-BC^2}{DE^2+DF^2-EF^2}$

Proof:

As BC= EF , & $\angle A = \angle D$

When we super impose EF on BC, B,A,D,C will be concyclic.



Consider the above picture, Here E & F coincide with B & C respectively.

Construction:

Drop AX ⊥ BC and DY⊥ BC. AX & DY intersect BC at H & G respectively. By Orthocentre Theorem in "Raja Climax theorems on Geometry" P & Q are Orthocentre of ΔABC & ΔDBC respectively.

By Rider 2 in the book **"Novelties of Geometry" by Raja Climax**, page no : 39

$$\frac{AH}{DG} = \frac{AB^2 + AC^2 - BC^2}{DB^2 + DC^2 - BC^2}$$

$$= \frac{AB^2+AC^2-BC^2}{DE^2+DF^2-EF^2} \qquad \text{[Since BC=EF]}$$

$$\frac{Area\ of\ \Delta ABC}{Area\ of\ \Delta DEF} = \frac{\frac{1}{2} \times BC \times AH}{\frac{1}{2} \times EF \times DG}$$

$$= \frac{AH}{DG}$$

$$\frac{Area\ of\ \Delta ABC}{Area\ of\ \Delta DEF} = \frac{AB^2+AC^2-BC^2}{DE^2+DF^2-EF^2}$$

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