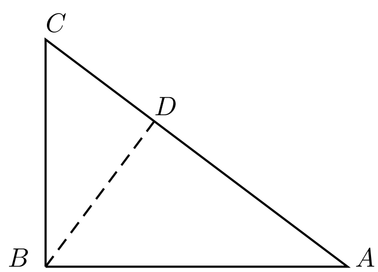
PROOF 1: By drawing a perpendicular

Given: A right-angled triangle ABC, right-angled at B.
To Prove: $AC^2 = AB^2 + BC^2$
Construction: Draw a perpendicular BD meeting AC at D.



We know, $\triangle ADB \sim \triangle ABC$
Therefore, $\frac{AD}{AB} = \frac{AB}{AC}$ (corresponding sides of similar triangles)
Or, $AB^2 = AD \times AC \cdots (1)$
$Also, \triangle BDC \sim \triangle ABC$
Therefore, $\frac{CD}{BC} = \frac{BC}{AC}$ (corresponding sides of similar triangles)
Or, $BC^2 = CD \times AC \cdots (2)$

Adding the equations (1) and (2) we get,

$$AB^2 + BC^2 = AD \times AC + CD \times AC$$
$$AB^2 + BC^2 = AC(AD + CD)$$

Since, $AD + CD = AC$
Therefore, $AC^2 = AB^2 + BC^2$
Hence, the Pythagorean theorem is **proved**.