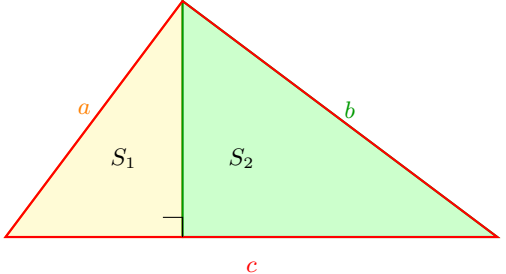
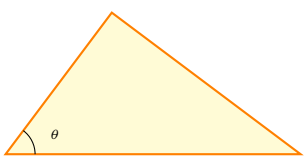
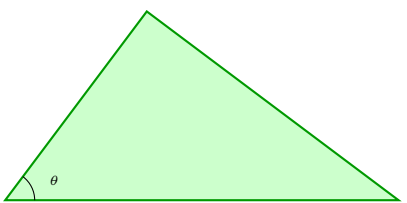
Decomposition:

$S = S_1 + S_2$

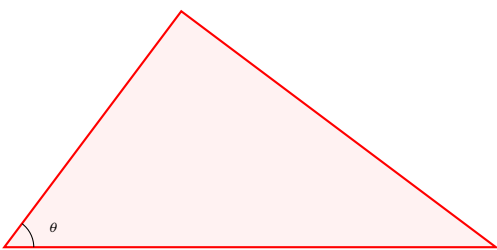




hypotenuse $= a$



hypotenuse $= b$



hypotenuse $= c$

S_1

Area $\propto$ (side)^2

$S_1 = a^2 \cdot k$

S_2

Area $\propto$ (side)^2

$S_2 = b^2 \cdot k$

S

Area $\propto$ (side)^2

$S = c^2 \cdot k$

(where constant k depends on θ)

Substitute separate areas into decomposition equation:

$S_1 + S_2 = S \quad \Rightarrow \quad a^2 \cdot k + b^2 \cdot k = c^2 \cdot k$

Divide by k to finish proof:

$$\mathbf{a^2 + b^2 = c^2}$$