

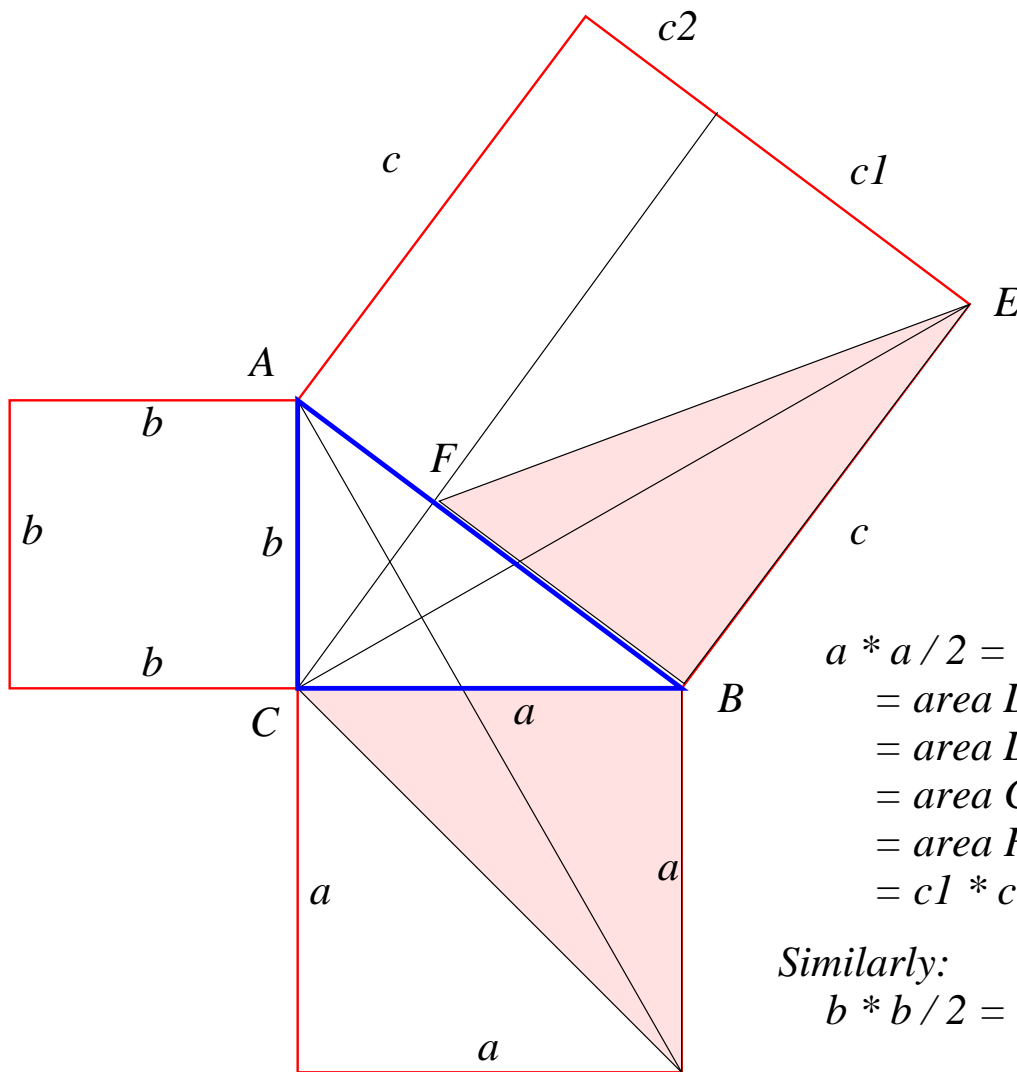
# Euclid's "windmill" proof of the Theorem of Pythagoras

*Pythagoras Theorem: For right triangle BCA,*

$$a * a + b * b = \text{square on } BC + \text{square on } CA = \text{square on } AB = c * c.$$

*Proof:*

*Construct F so that CF is perpendicular to AB.*



$$\begin{aligned} a * a / 2 &= \\ &= \text{area } DBC \\ &= \text{area } DBA \text{ (by shearing)} \\ &= \text{area } CBE \text{ (by side-angle-side)} \\ &= \text{area } FBE \text{ (by shearing)} \\ &= c1 * c / 2 \end{aligned}$$

*Similarly:*

$$b * b / 2 = c2 * c / 2$$

*Add and then multiply by 2 to get:*

$$a * a + b * b = (c1 + c2) * c = c * c$$