Pythagorean Theorem

An Intuitive Argument
To be proven: $a^2 + b^2 = c^2$
Shape of squares does not matter

The area of the heads is $E_a^2$, $E_b^2$ and $E_c^2$ for some $E$. If we knew $E_a^2+E_b^2 = E_c^2$ we would be done.

Could be elephant heads so long as they are same shape. Two little elephants add up to the big elephant
To be proven: \( a^2 + b^2 = c^2 \)

Construct the altitude to the longest side right angle
Flop the little triangles out along their longest sides and the whole triangle out along the hypotenuse.

To be proven:

\[ a^2 + b^2 = c^2 \]
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The 3 red triangles are similar and the 2 little ones are made by cutting the larger in 2 pieces, thus they add up.

QED
Pythagorean Theorem.

in words

Many can state the Pythagorean Theorem, few can prove it. I intend to rectify that situation here and now.

The theorem can be illustrated by drawing a right triangle and erecting squares on each of its faces. The theorem states that the sum of the areas of the two smaller squares equals the area of the larger square.

The first insight is that it does not matter what figures are erected on the sides so long as the three figures are all the same shape (technical jargon: similar).

Start instead with the same right triangle, but construct the altitude to the longer side, creating two smaller triangles inside the starting triangle. All three triangles are the same shape and the area of the two little ones together add up to the area of the containing triangle.

Now, flip all three triangles out of the original triangle, each along their longest edge, making a figure similar to the one with squares, but with triangles on each side instead.

The ancients would have written QED.
If you want more: http://www.cut-the-knot.org/pythagoras/