

## “So Simple”

That is what the hero of Aldous Huxley’s short story *Young Archimedes* says, as he describes his demonstration of Pythagoras’ theorem, based on the Figures displayed in “Guido’s Plaything”.

Let’s spell out what was obvious to Guido at a glance.

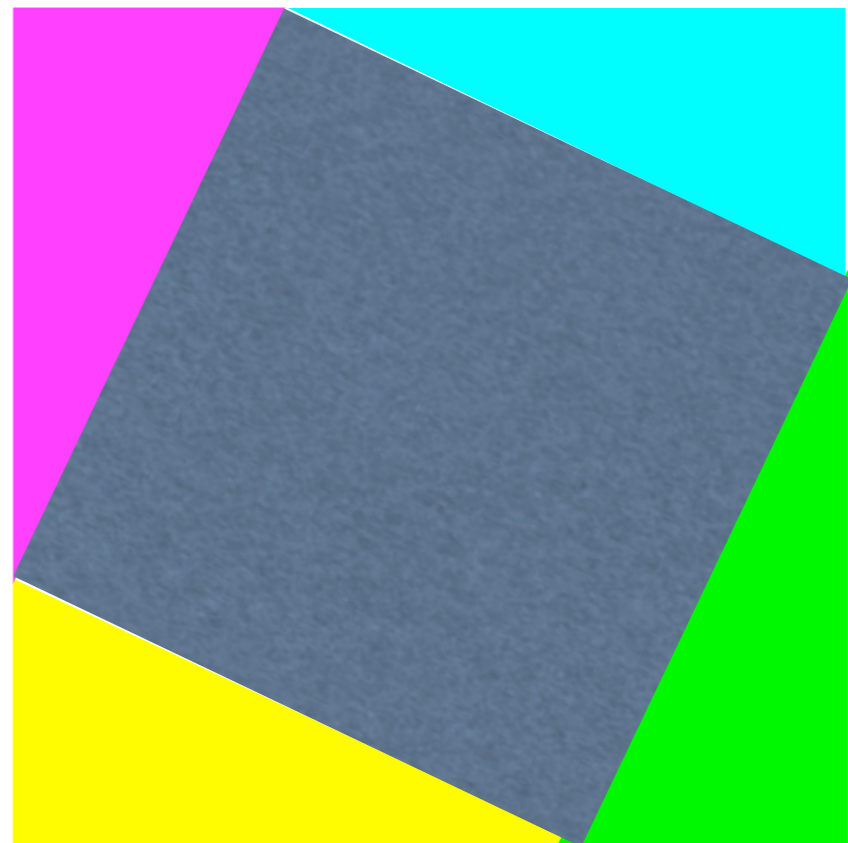
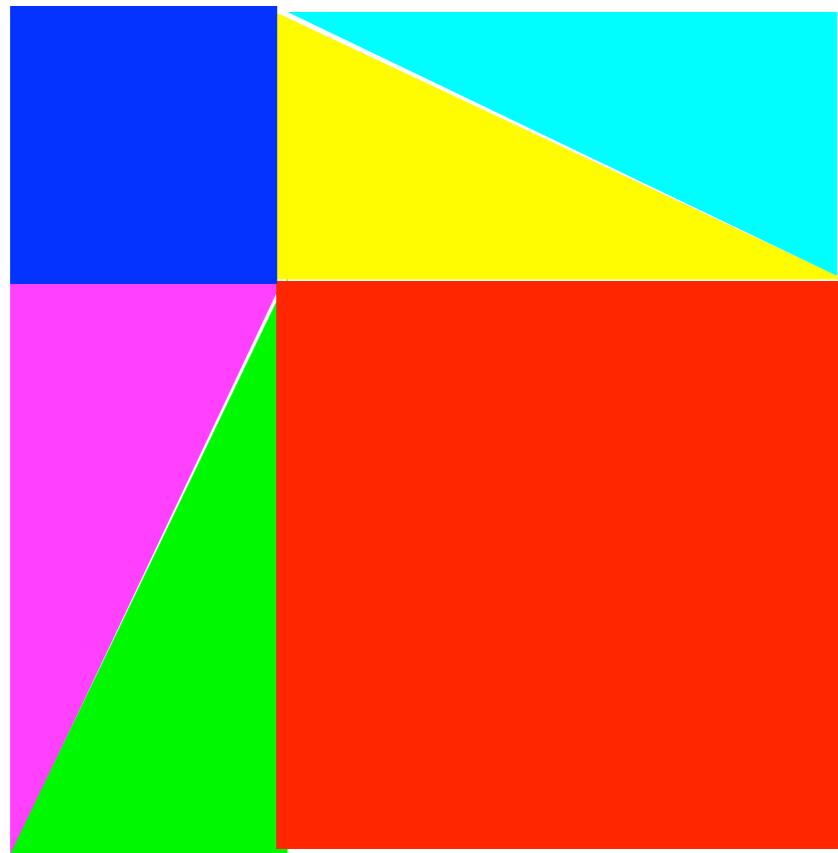
Each of the two large tiled squares contains four colored triangles, that are matched in the other large square. All the colored triangles are right triangles, and each of them is the same size. Let’s say the length of the smallest side is  $a$ , the next smallest  $b$ , and the longest (the hypotenuse)  $c$ . Then it’s easy to see that the sides of the large squares have length  $a + b$ , and in particular that the two squares have equal areas. So the non-triangular parts of the large squares must also have equal areas.

But what are those equal areas? In the first large square, on the left, we have a blue square with side  $a$ , and a red square with side  $b$ . Their total area is  $a^2 + b^2$ . In the second large square, on the right, we have a grey square with side  $c$ , and so area  $c^2$ . We conclude that

$$a^2 + b^2 = c^2 \tag{1}$$

– which is Pythagoras’ theorem.

You can read Huxley’s story of tragic genius here: <http://bit.ly/18vmMT9>.



Guido's Plaything