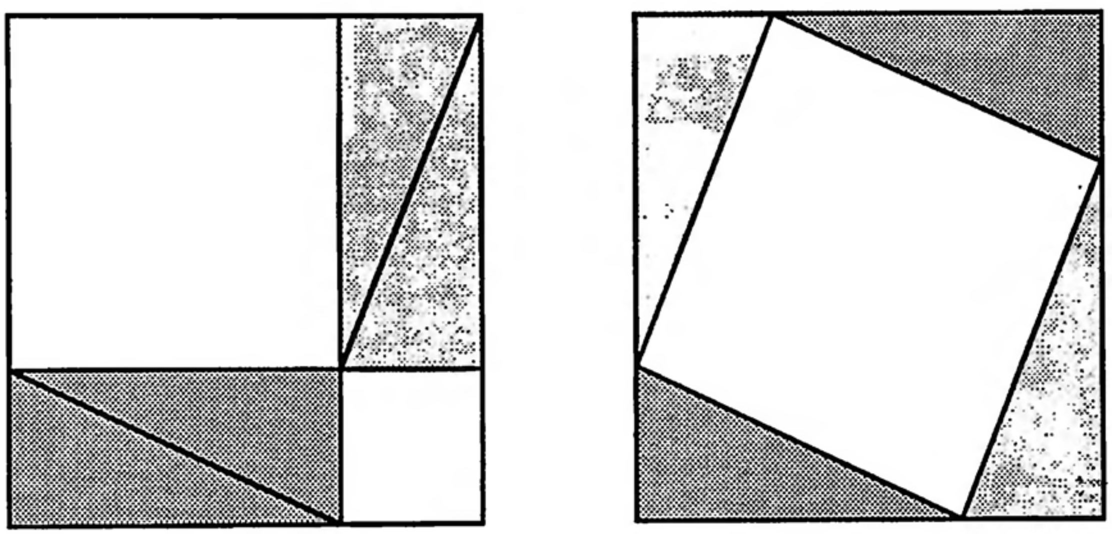
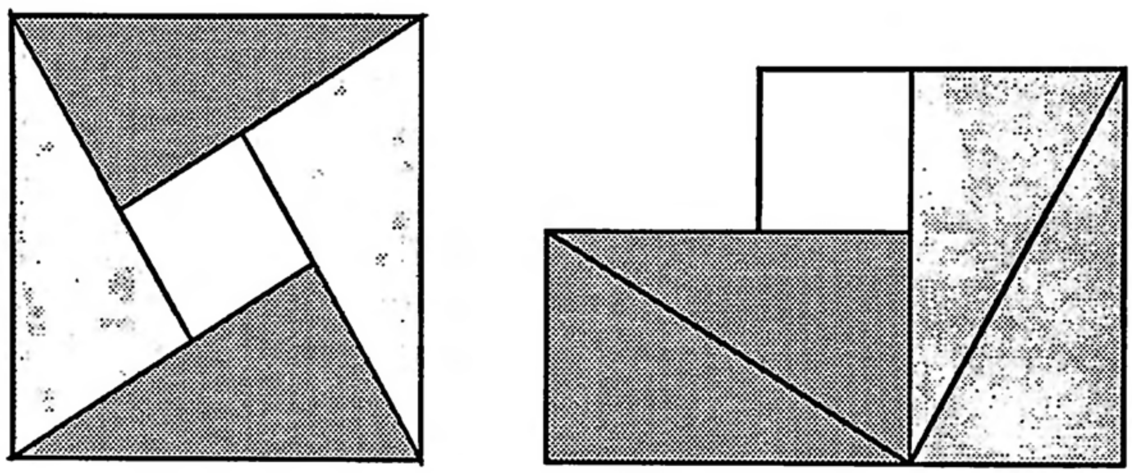
The Pythagorean Theorem I



—adapted from the *Chou pei suan ching*
(author unknown, circa B.C. 200?)

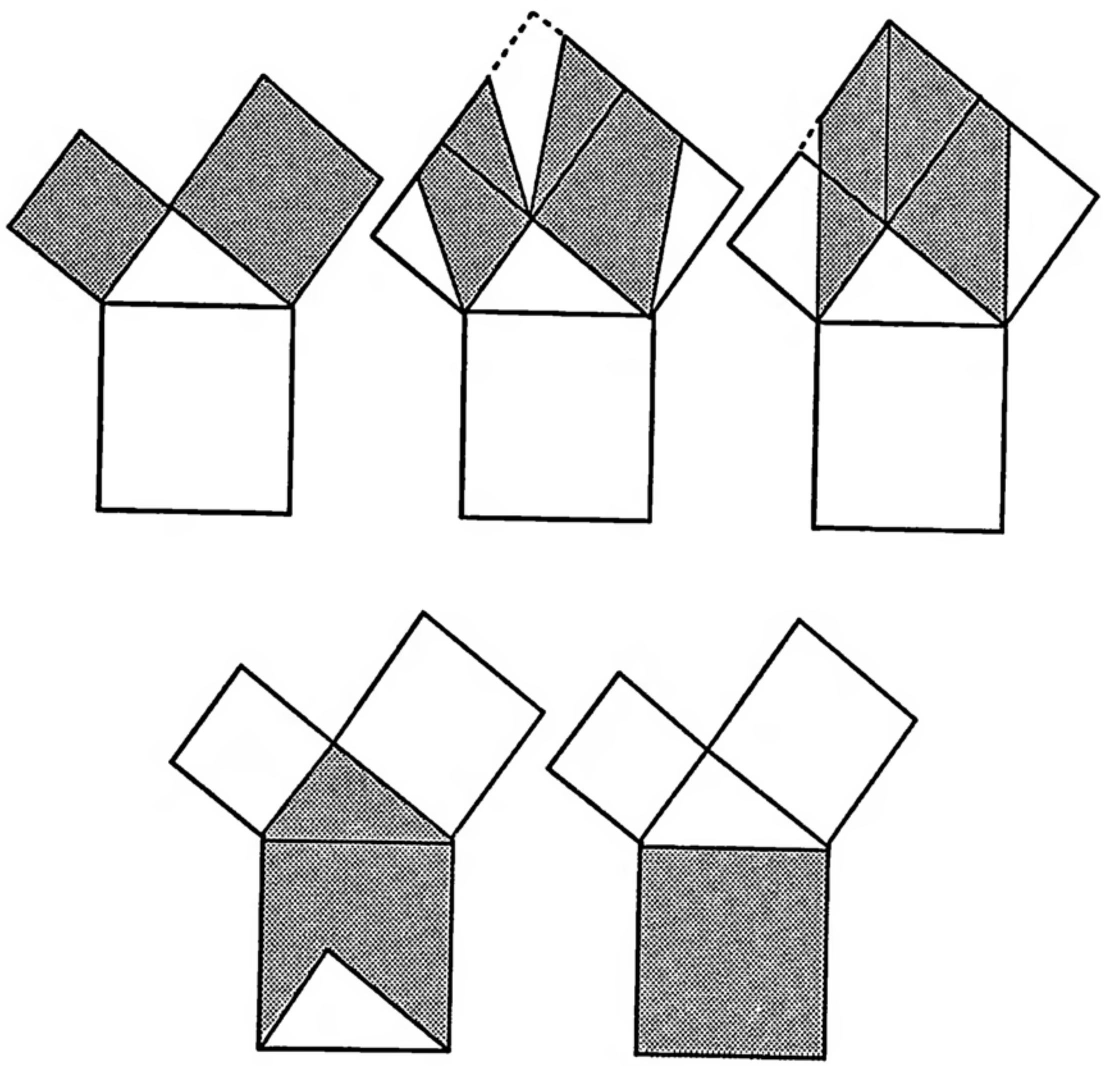
The Pythagorean Theorem II



Behold!

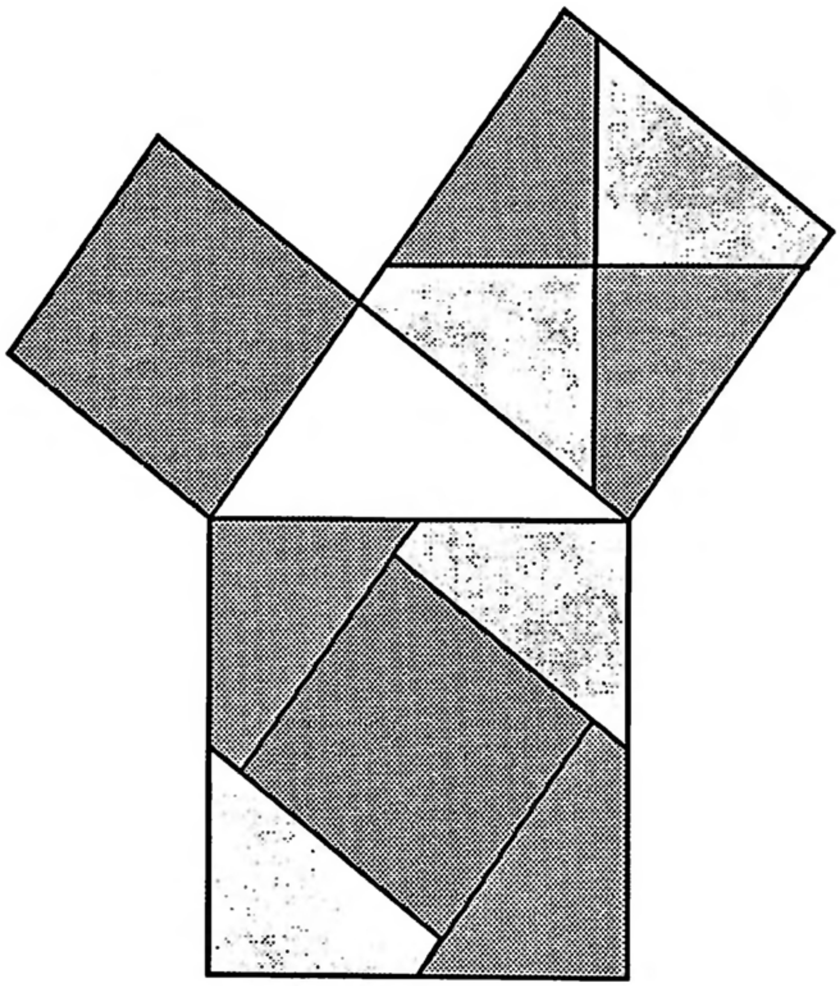
—Bhāskara (12^{th} century)

The Pythagorean Theorem III



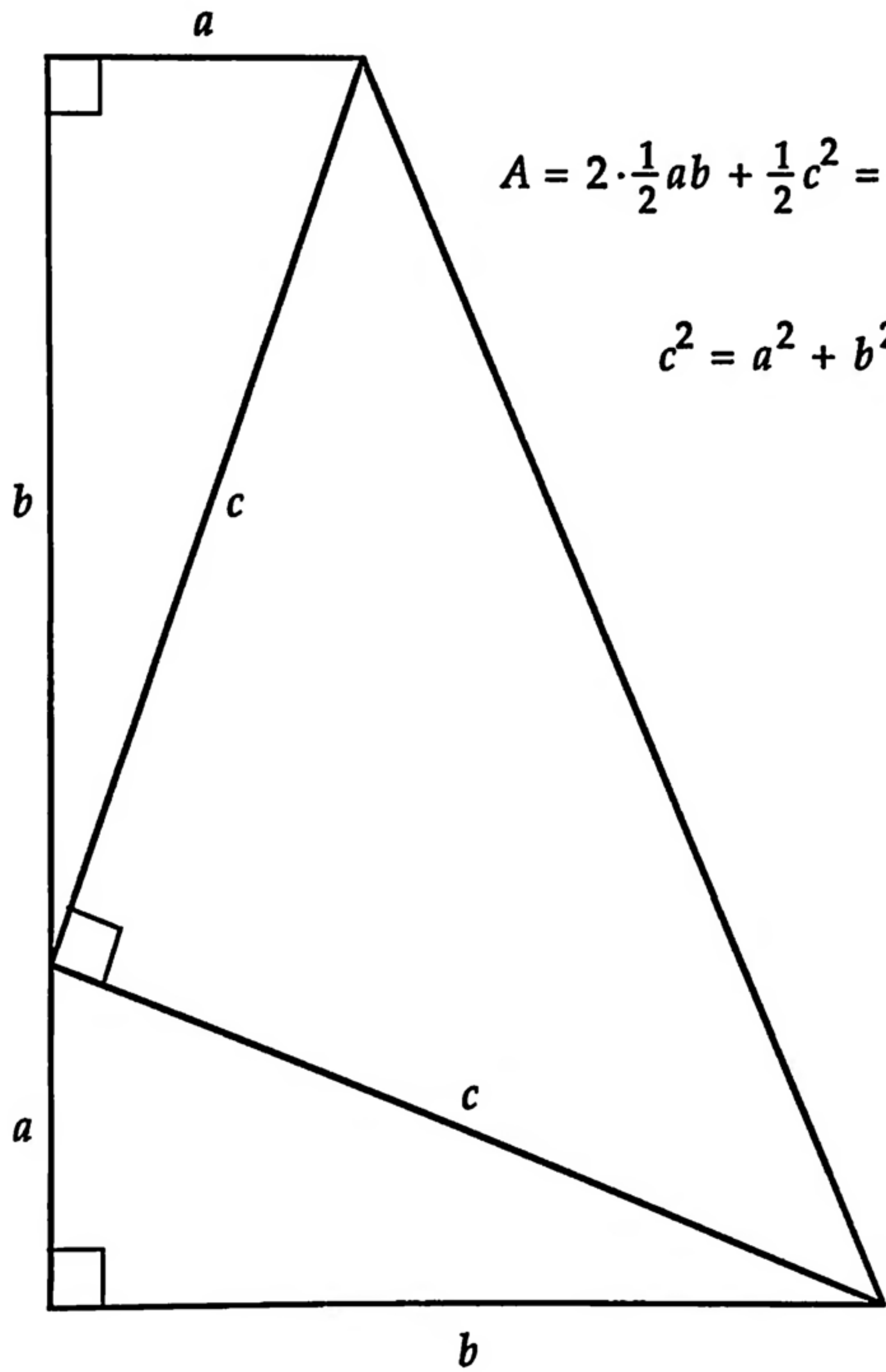
—based on Euclid's proof

The Pythagorean Theorem IV



—H. E. Dudeney (1917)

The Pythagorean Theorem V



$$A = 2 \cdot \frac{1}{2}ab + \frac{1}{2}c^2 = \frac{1}{2}(a+b)^2$$

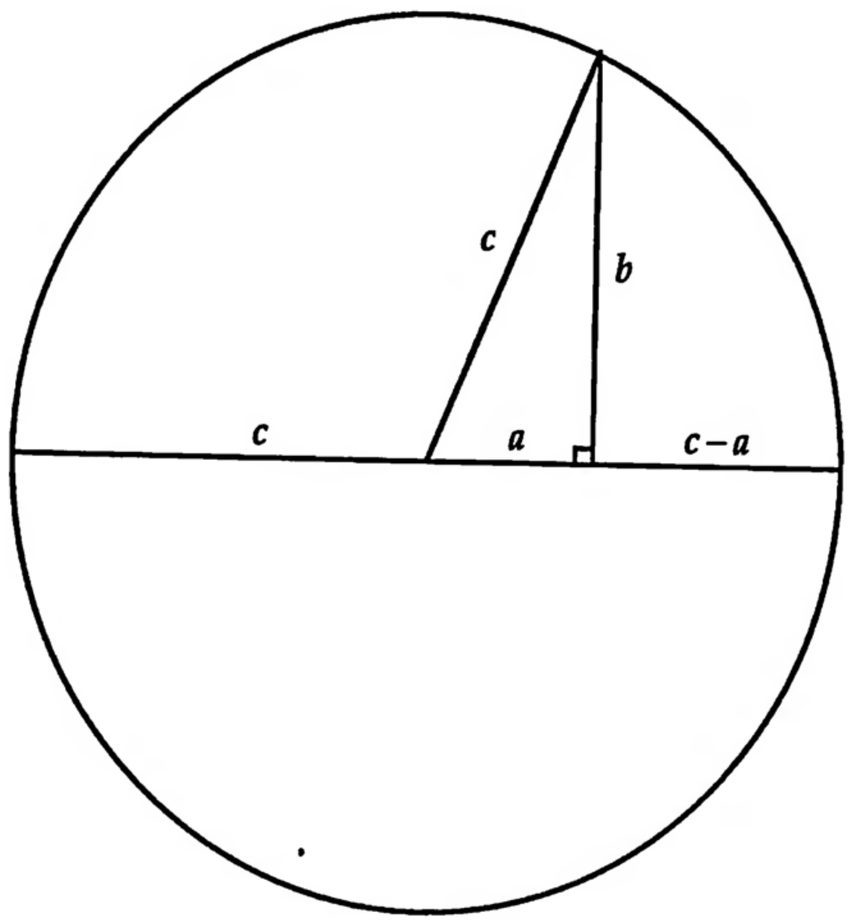
$$c^2 = a^2 + b^2$$

—James A. Garfield (1876)
20th President of the United States

The Pythagorean Theorem VI

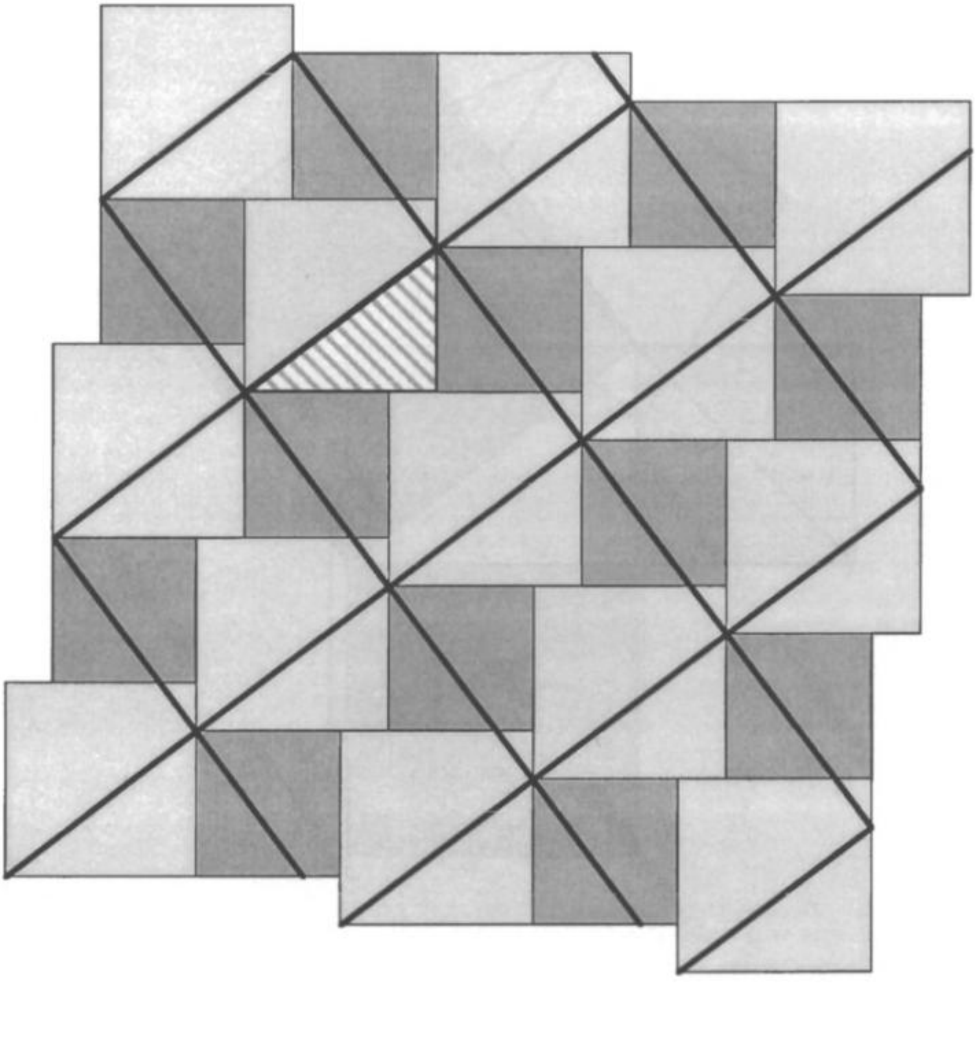
$$\frac{c+a}{b} = \frac{b}{c-a}$$

$$a^2 + b^2 = c^2$$



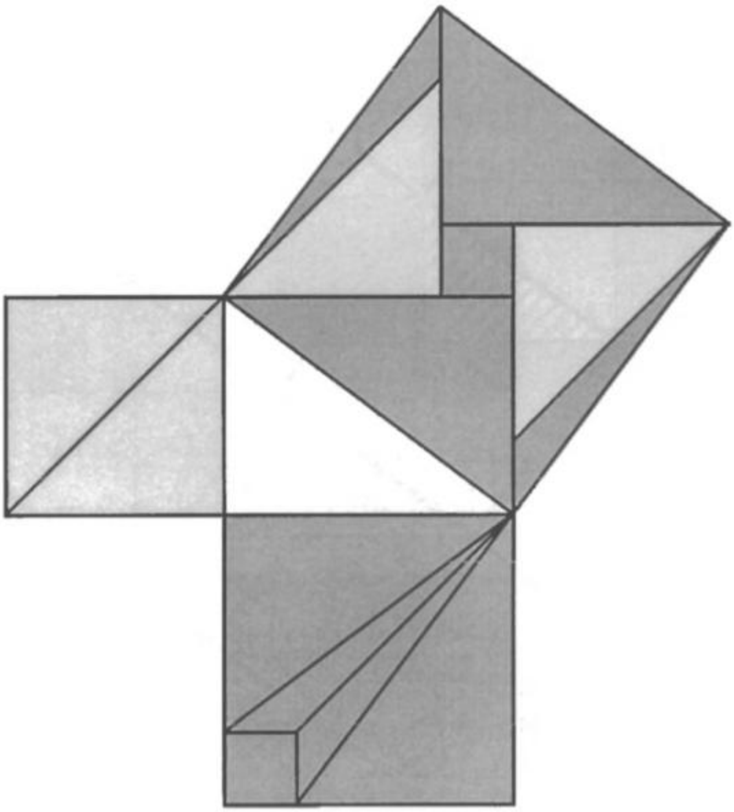
—Michael Hardy

The Pythagorean Theorem VII



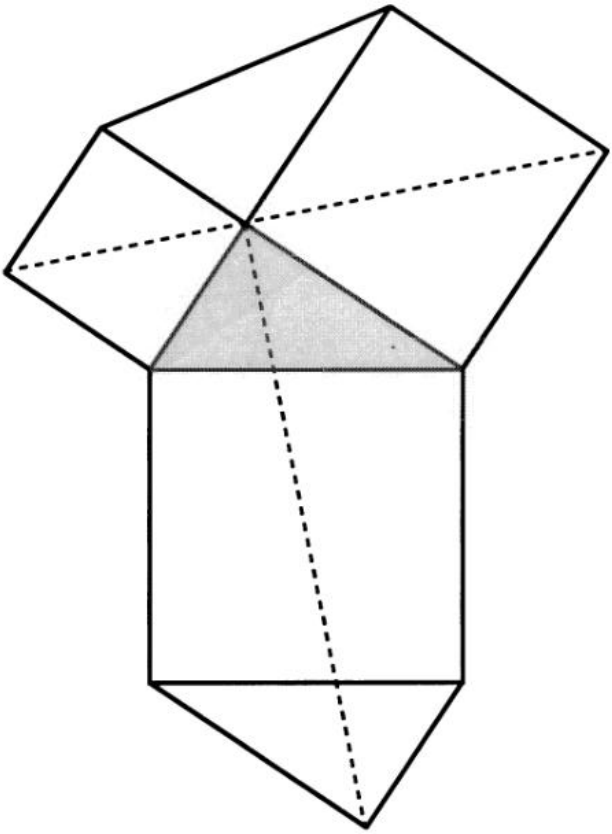
—Annairizi of Arabia (circa A.D. 900)

The Pythagorean Theorem VIII



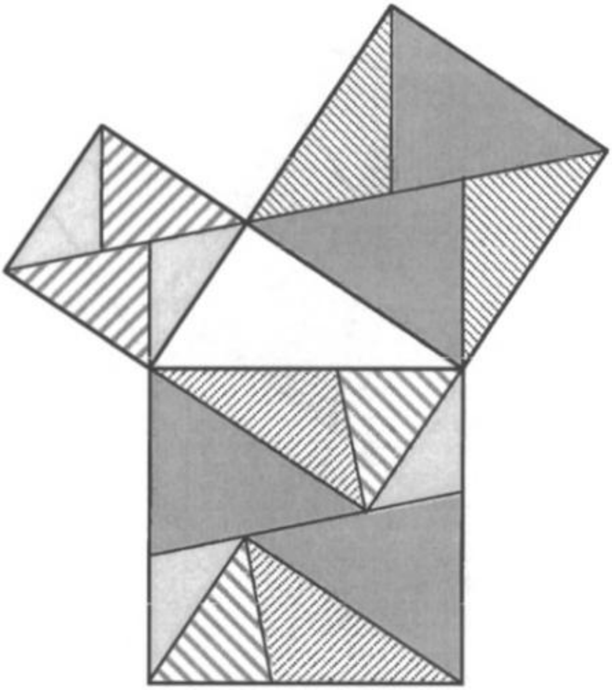
—Liu Hui (3rd century A.D.)

The Pythagorean Theorem IX



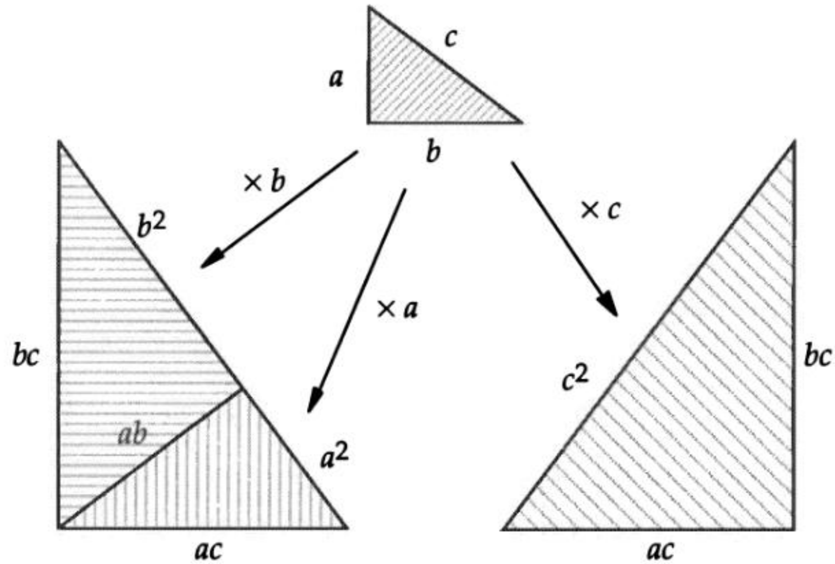
—Leonardo da Vinci (1452-1519)

The Pythagorean Theorem X



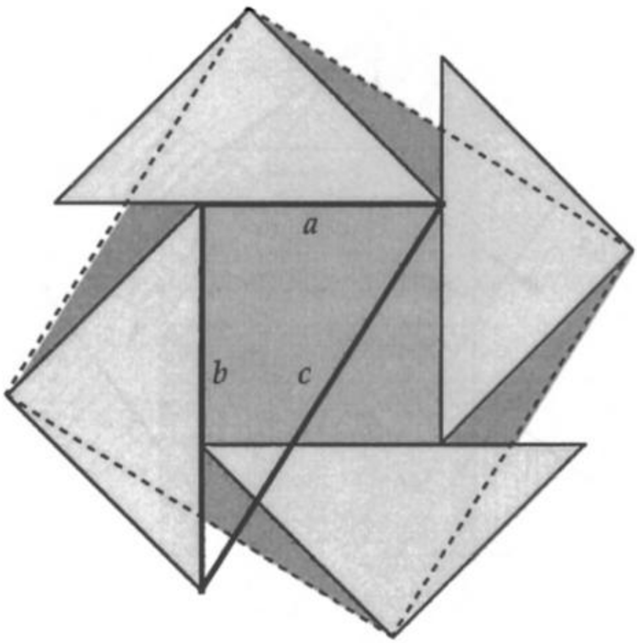
—J. E. Böttcher

The Pythagorean Theorem XI



—Frank Burk

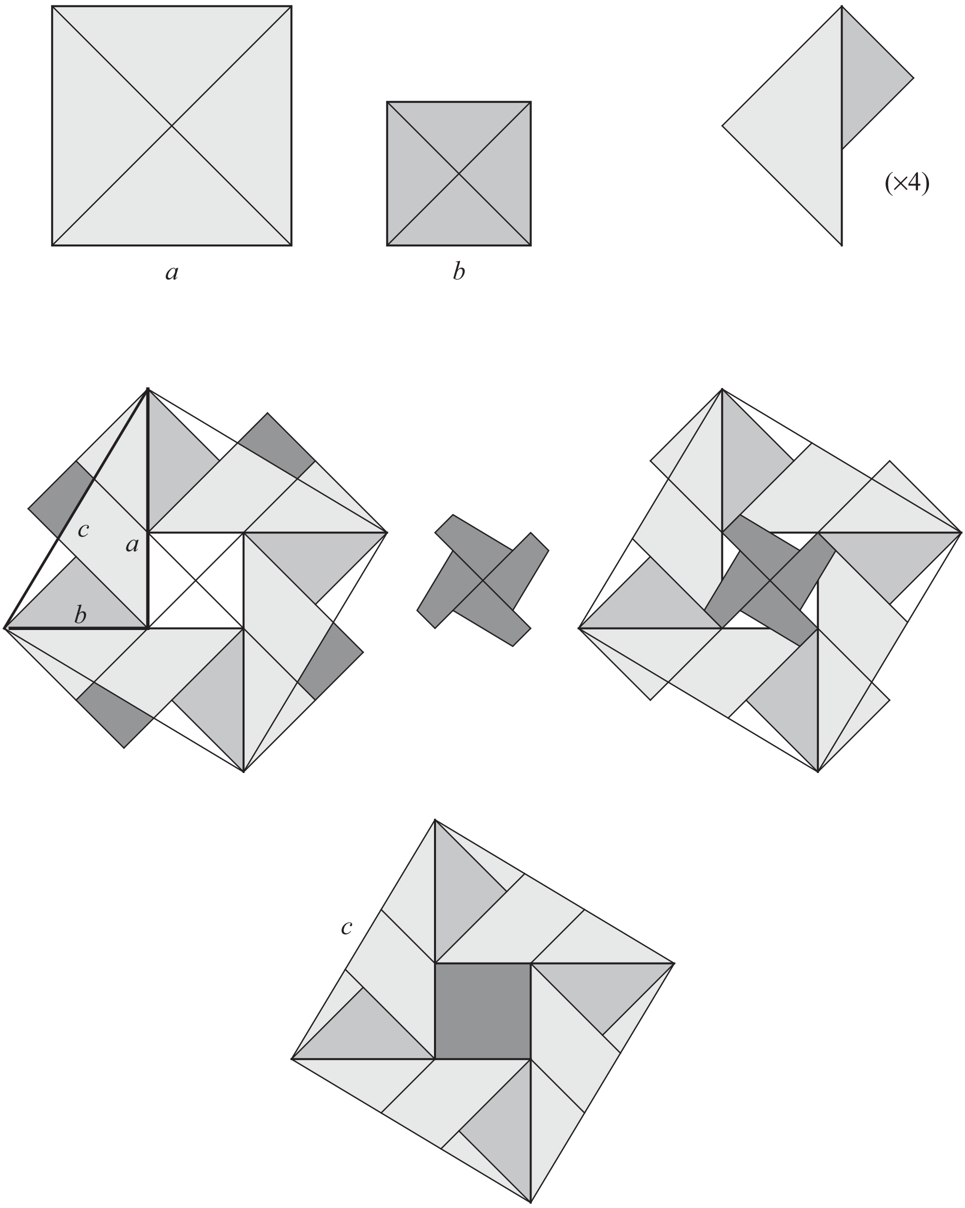
The Pythagorean Theorem XII



$$a^2 + b^2 = c^2$$

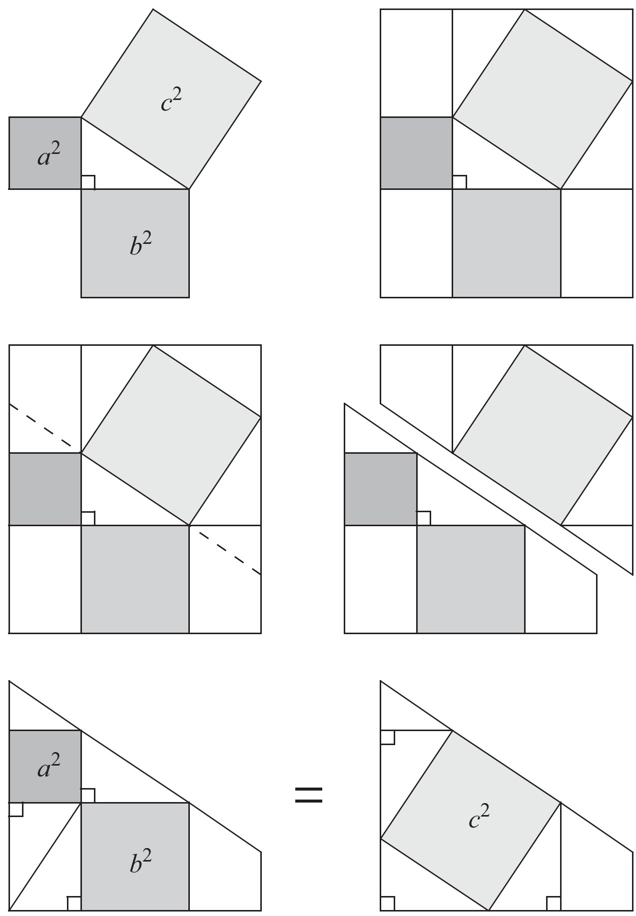
—Poo-sung Park

The Pythagorean Theorem XIII



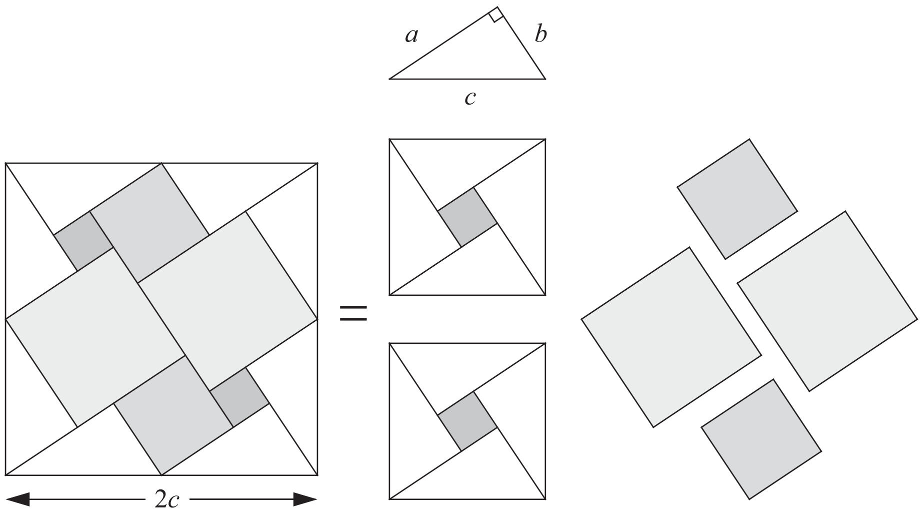
—José A. Gomez

The Pythagorean Theorem XIV



$$a^2 + b^2 = c^2.$$

The Pythagorean Theorem XV

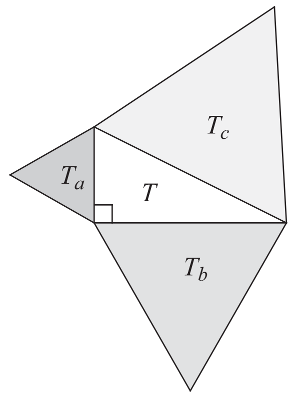


$$(2c)^2 = 2c^2 + 2a^2 + 2b^2$$
$$\therefore c^2 = a^2 + b^2.$$

—Nam Gu Heo

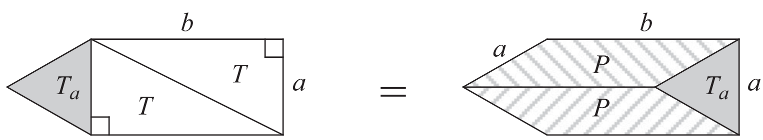
The Pythagorean Theorem XVI

The Pythagorean theorem (Proposition I.47 in Euclid's *Elements*) is usually illustrated with squares drawn on the sides of a right triangle. However, as a consequence of Proposition VI.31 in the *Elements*, any set of three similar figures may be used, such as equilateral triangles as shown at the right. Let T denote the area of a right triangle with legs a and b and hypotenuse c, let T_a, T_b, and T_c denote the areas of equilateral triangles drawn externally on sides a, b, and c, and let P denote the area of a parallelogram with sides a and b and 30° and 150° angles. Then we have



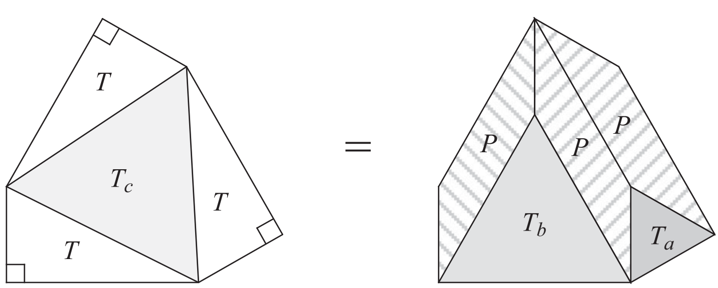
1. $T = P$.

Proof.



2. $T_c = T_a + T_b$.

Proof.



—Claudi Alsina & RBN