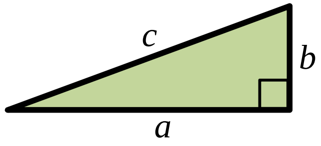
Pythagoras's theorem: for all right angled triangles with sides *a, b, c*



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

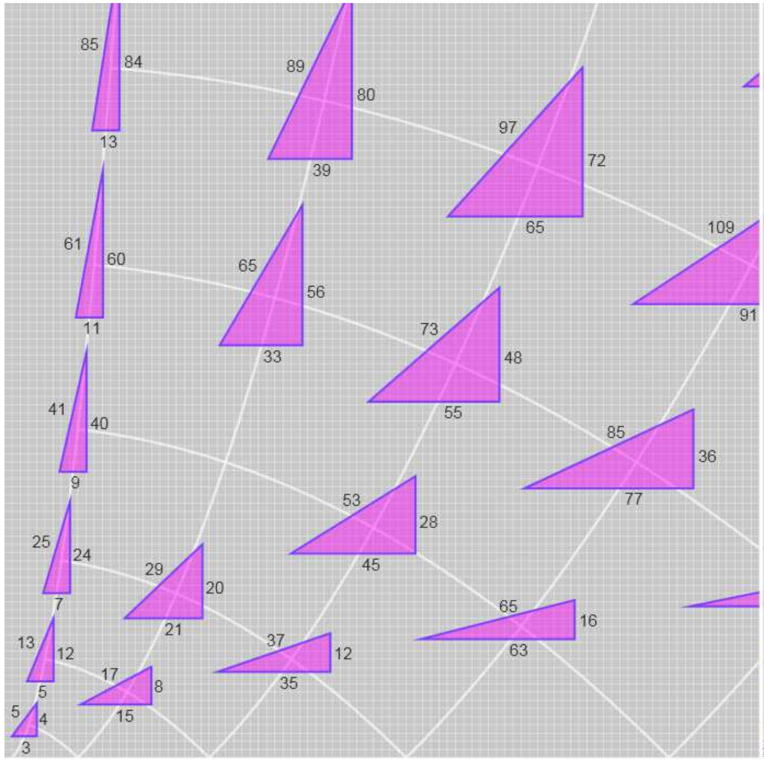
Pythagorean triples

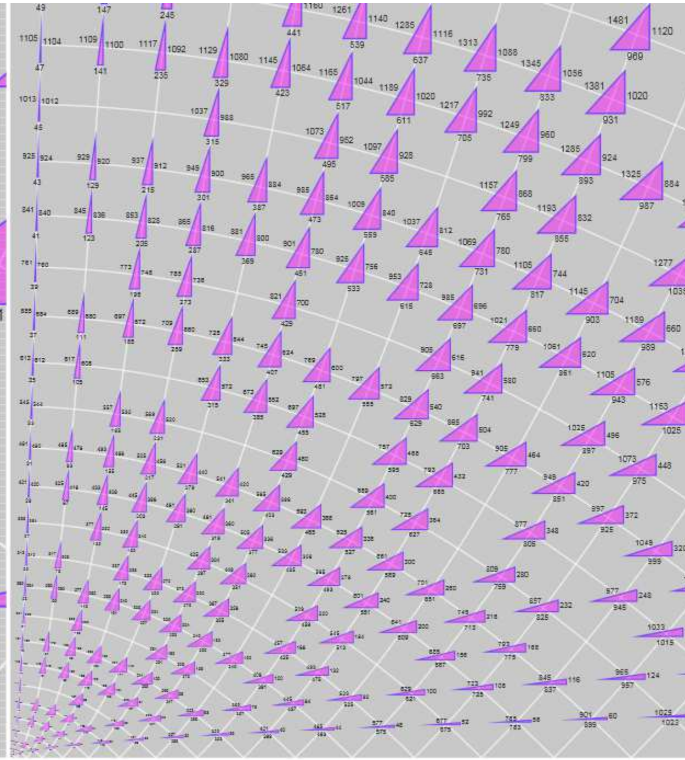
$$a = k\left(m^2 - n^2\right)$$

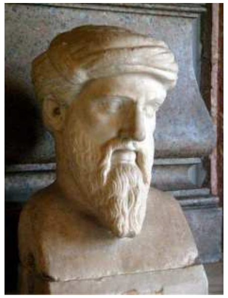
$$b = 2kmn$$

$$c = k\left(m^2 + n^2\right)$$

$$m, n, k \in \mathbb{Z}$$

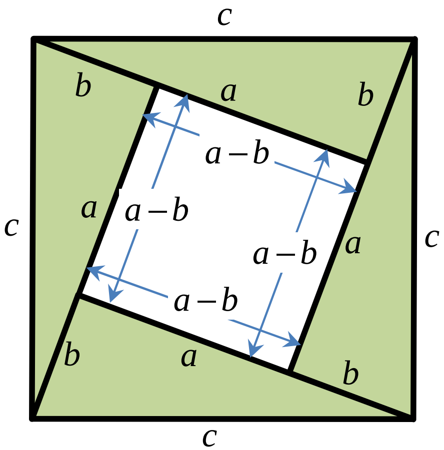






Pythagoras
570-495 BC
Samos, Greece

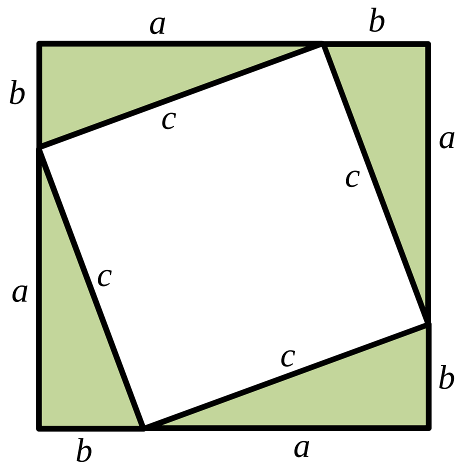
Three *proofs* of Pythagoras' theorem



$$c^2 = 4 \times \tfrac{1}{2}ab + (a-b)^2$$

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

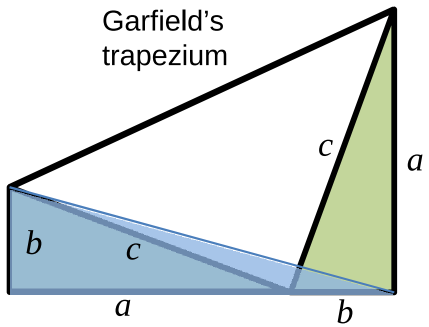
$$\boxed{c^2 = a^2 + b^2}$$



$$4 \times \tfrac{1}{2}ab + c^2 = (a+b)^2$$

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

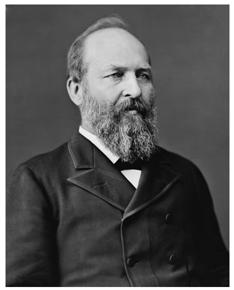
$$\boxed{c^2 = a^2 + b^2}$$



$$\tfrac{1}{2}c^2 + 2 \times \tfrac{1}{2}ab = \tfrac{1}{2}b(a+b) + \tfrac{1}{2}a(a+b)$$

$$\tfrac{1}{2}c^2 + ab = \tfrac{1}{2}ba + \tfrac{1}{2}b^2 + \tfrac{1}{2}a^2 + \tfrac{1}{2}ab$$

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



James Garfield.
20th US President
1831-1881