**Theorem.** A right triangle with legs 3 and 4 has hypotenuse 5.

**Proof.**

A referee offered the following generalization. Consider integers $m > n > 0$. Draw line segments from $(0, 0)$ to $(2mn, 2n^2)$ and from $(0, m^2 + n^2)$ to $(mn, n^2)$; these are perpendicular. The corresponding right triangle has legs $m^2 - n^2$ and $2mn$ and hypotenuse $m^2 + n^2$. Any primitive right triangle is given by such a pair with the additional criteria that $m$ and $n$ are relatively prime and have opposite parity [1].

**Summary.** Without reference to the Pythagorean theorem, we show that a right triangle with legs 3 and 4 has hypotenuse 5. The figure can be modified for other integer right triangles.

**Reference**


http://dx.doi.org/10.4169/college.math.j.47.2.101

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