

## Pythagorean Theorem: an Alternative Formula

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### Abstract

In this note we give a formula for the pythagorean theorem.

### Introduction

Pythagorean theorem (Maor, 2019):

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

For example:

$$5^2 = 3^2 + 4^2$$

$$10^2 = 8^2 + 6^2$$

$$13^2 = 12^2 + 5^2$$

$$25^2 = 24^2 + 7^2$$

$$26^2 = 10^2 + 24^2$$

### Formula

Alternative Formula for the pythagorean theorem:

$$c = a + b - (a/i)$$

a = even number

b = prime number, taking the largest one

$$c = ((i-1)a)/i + b$$

i = 1, 2, 3, 4 (sequence of prime numbers), it means prime numbers = 2, 3, 5, 7, ..., then the proposed i is the order of the prime number, namely, i = 1, 2, 3, 4, ....

For example:

If: b contains 5 and is a prime number, a is an even number:

Then,  $c = a + b - a/3$

Ex =  $c = 13, a = 12, b = 5$

$c = a + b - a/3$

$13 = 12 + 5 - 12/3 = 17 - 4 = 13$

Ex =  $c = 26, a = 24, b = 10$

$26 = 24 + 10 - 24/3 = 34 - 8 = 26$

If: b contains 7 & is a prime number, a is an even number:

then,  $c = a + b - a/4$

$25 = 24 + 7 - 24/4$

$25 = 31 - 6 = 25$

## References

Maor, E. (2019). The Pythagorean Theorem. Princeton University Press.  
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