

# The Wizard of Oz

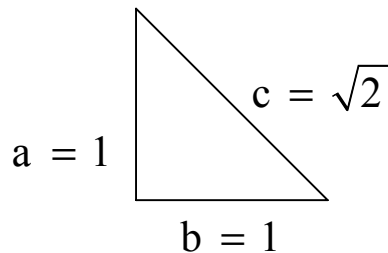
## "If I Only Had A Brain!"

The Wizard of Oz conferred the Honorary Degree of Th.D. (Doctor of Thinkology) upon the Scarecrow, after which the Scarecrow proudly proclaimed: "The sum of the square roots of any two sides of an isosceles triangle is equal to the square root of the remaining side". Then, the Scarecrow exclaimed: "Oh Joy, Rapture, I've got a brain!"

1) The Scarecrow was WRONG!

Give a counter-example disproving the Scarecrow's claim.

Answer: Take the case of an isosceles right triangle whose legs are 1 unit long.  
Then the hypotenuse would be  $\sqrt{2}$  units long.



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

$$1^2 + 1^2 = c^2$$

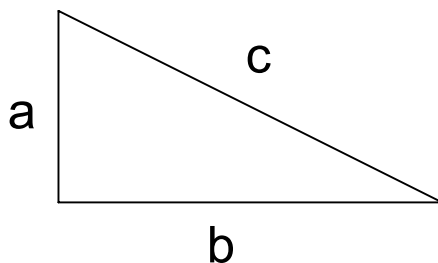
$$2 = c^2$$

$$c = \sqrt{2}$$

According to the scarecrow:  $\sqrt{1} + \sqrt{1} \stackrel{?}{=} \sqrt{\sqrt{2}}$   
 $1 + 1 \neq \sqrt[4]{2}$

2) What did the Scarecrow mean to say?

Answer: "The sum of the squares of the legs of a right triangle is equal to the square of the hypotenuse."



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