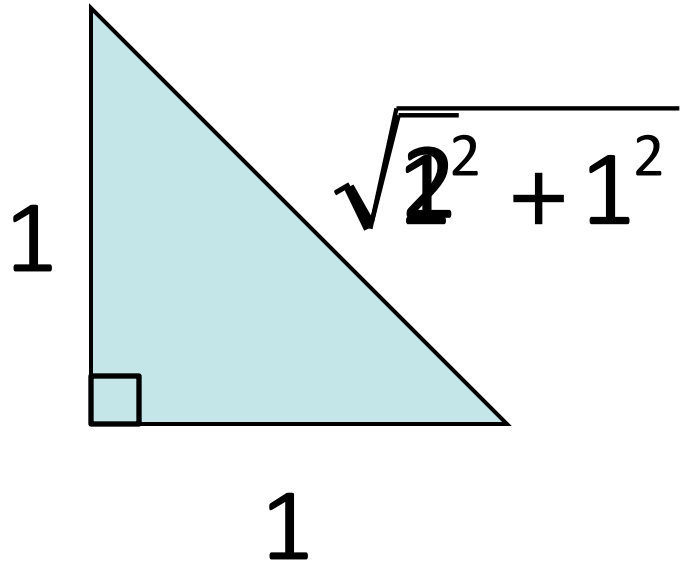
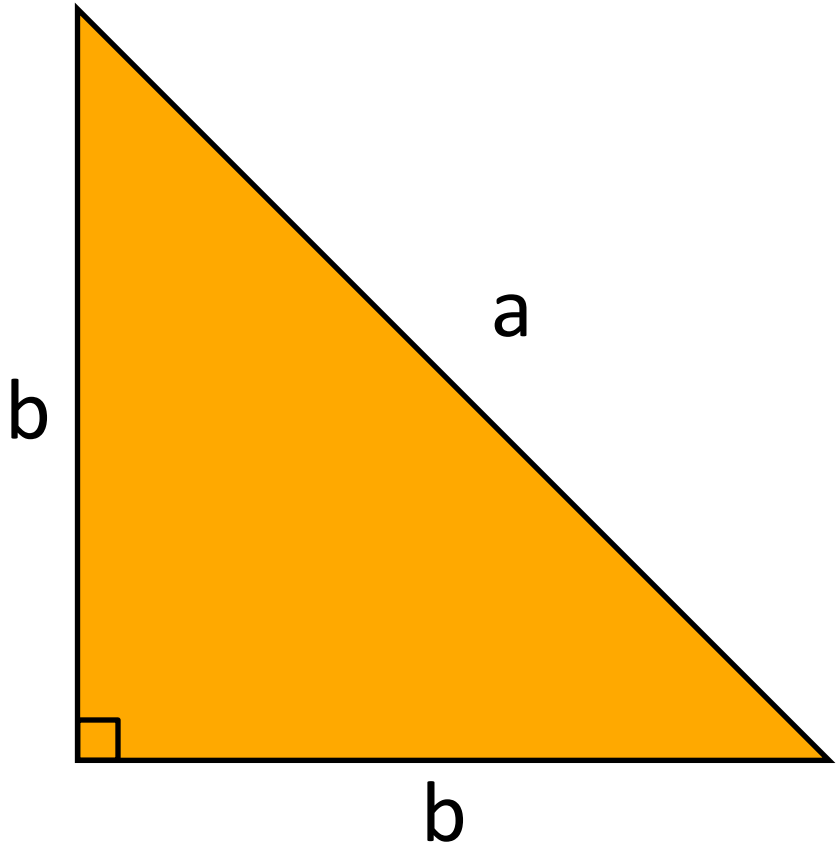




similar triangles
so

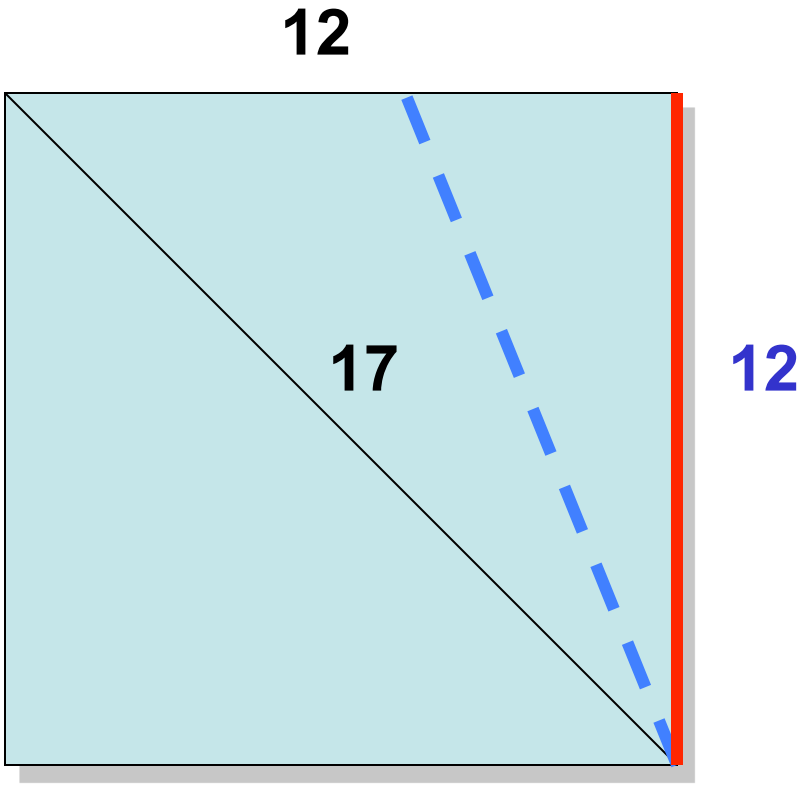
$$\sqrt{2} = \frac{a}{b}$$

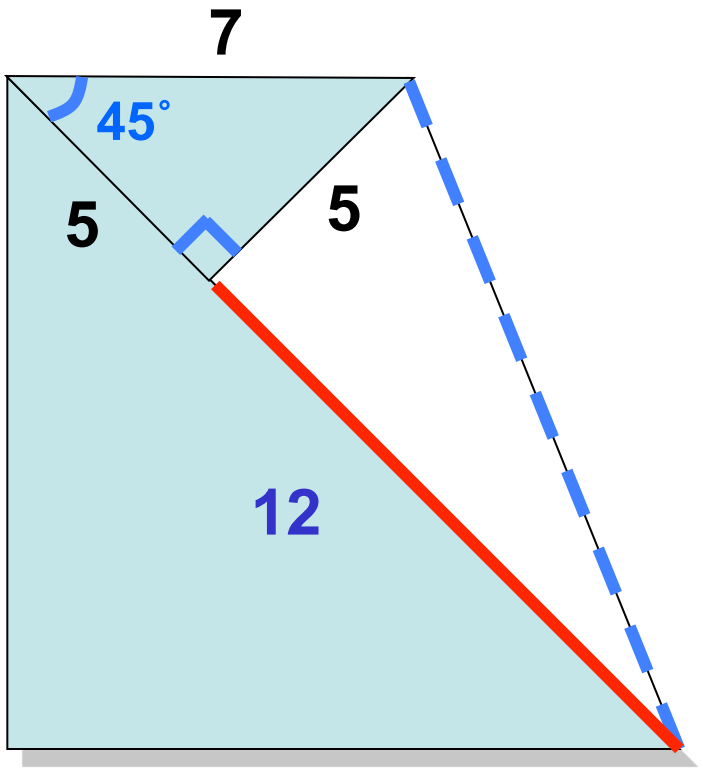
Can **a** and **b** both be whole numbers?

Proof that √2 is irrational by origami

THE IDEA

Suppose $\sqrt{2} = \frac{17}{12}$





So $\sqrt{2} = \frac{7}{5}$

We have found another fraction equal to √2, but with a smaller denominator

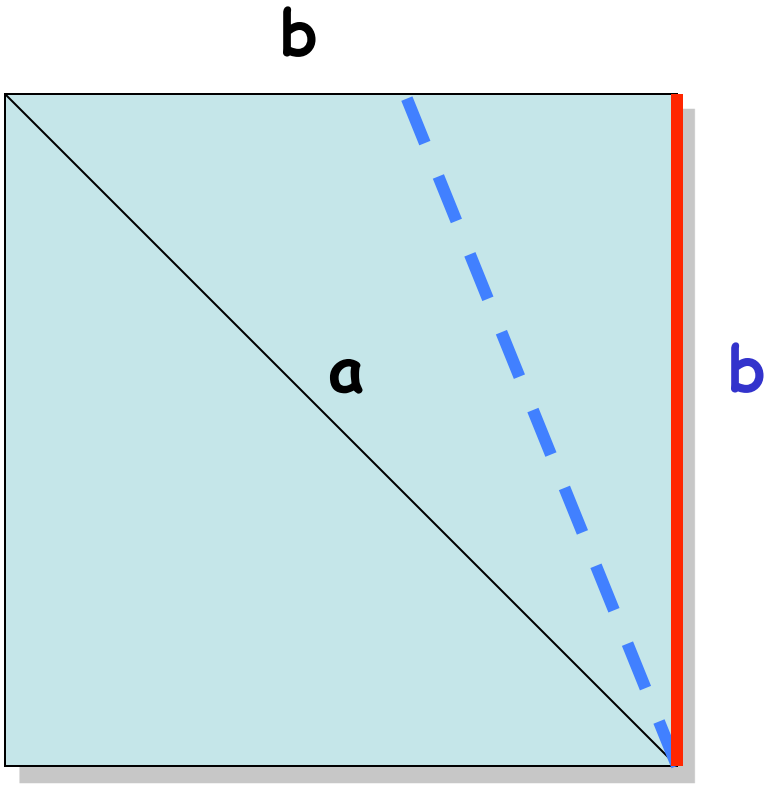
Proof that √2 is irrational

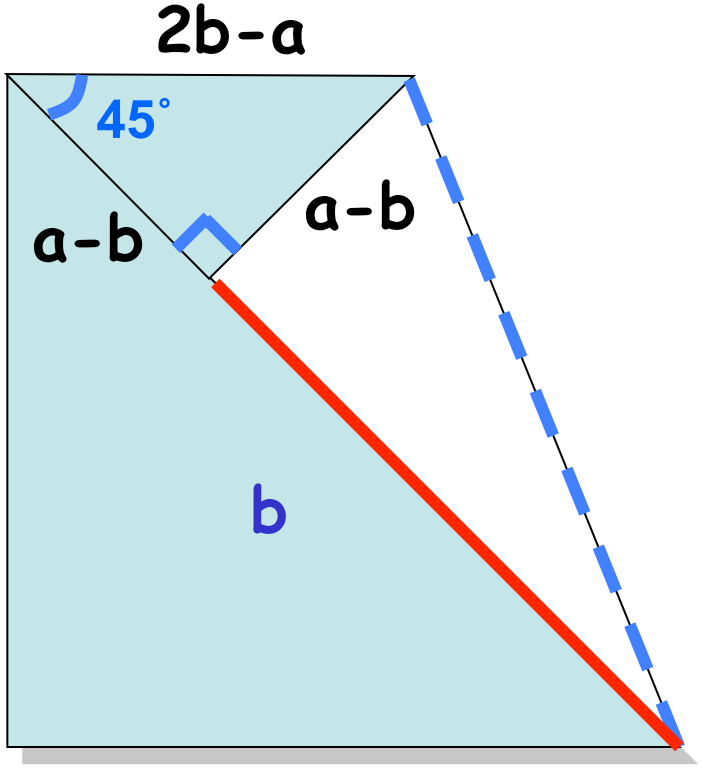
by origami

THE PROOF

Suppose it's rational $\sqrt{2} = \frac{a}{b}$

note: b < a < 2b





So $\sqrt{2} = \frac{2b-a}{a-b}$

We have found another fraction equal to √2, but with a smaller positive integer denominator

So if √2 is rational, we find an infinite decreasing sequence of integers less than b

But an infinite decreasing sequence of integers less than b is impossible!

so

our original assumption that $\sqrt{2}$ is rational must be wrong i.e. we have proved

$\sqrt{2}$ is irrational