

Goals for today:

- introductions
- what is a proof?

What is a proof?

logical explanation for how to get from $A \rightarrow B$
within given conditions/constraints
steps to manipulate A

↑
conclusion.
true or false

a proof is a method for ascertaining a truth.

how can we say if "something"
is true or false?

what is this
this
something

A *proposition* is a statement that is either true or false.

ex: $1 + 1 = 2$. ✓

I'm watching you, Nazowski. ✓

not propositions:

a.) Pass the salt, please. ✗

b.) What did you do over break? ✗

Theorem: Given a planar right triangle with side lengths a , b and c (meaning there is one angle of 90° , which we will take to be opposite the side with length c), then $c^2 = a^2 + b^2$.

Proof:

area of $\Delta_{abc} = \frac{1}{2}ab$

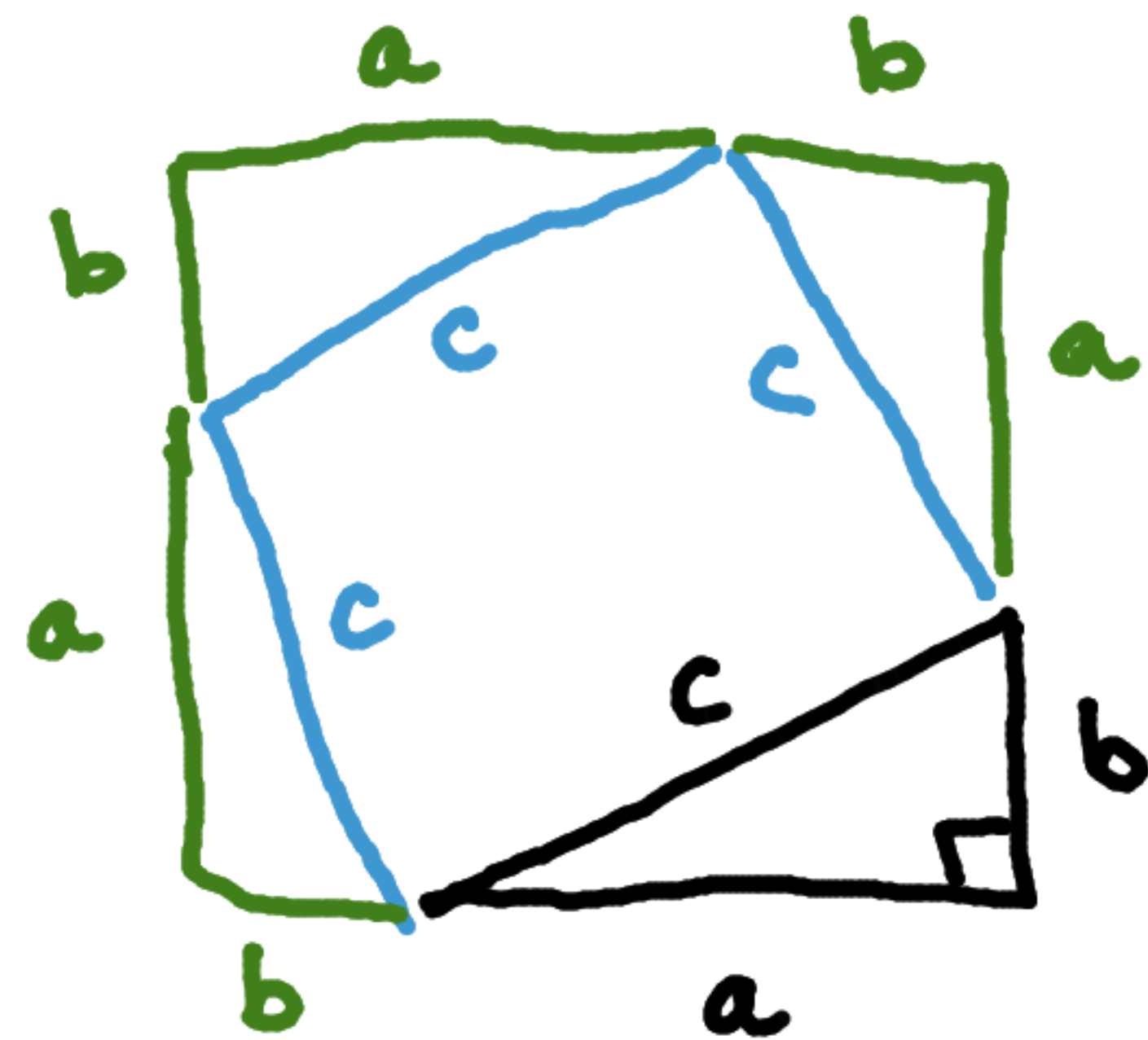
area of $\square_c = c^2$

area of $\square_{a+b} = (a+b)^2$

area of $\square_c + 4 \times \text{area of } \Delta_{abc} = \square_{a+b}$

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

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



QED
 always!