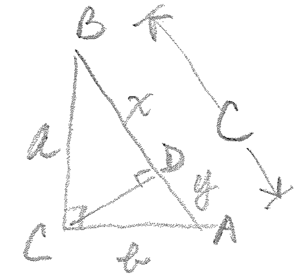
Proof of Pythagorean Theorem

Given: $\triangle ABC$ with right $\angle C$

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



① Draw $\overline{CD} \perp \overline{AB}$. → ② $\frac{a}{c}=\frac{x}{a}$ → ③ $a^2=cx$

↘ ④ $\frac{b}{c}=\frac{y}{b}$ → ⑤ $b^2=cy$

③, ⑤ → ⑥ $a^2+b^2=cx+cy$

→ ⑦ $a^2+b^2=c(x+y)$

⑧ $c=x+y$

⑦, ⑧ → ⑨ $a^2+b^2=c(c)$ → ⑩ $a^2+b^2=c^2$

① Thru a pt not on the line, there is exactly 1 line $\perp$ to given line.

② When an altitude is drawn from the rt $\angle$ to the hypotenuse, the leg is the geometric mean between the hypotenuse and the hyp. segment adjacent to that leg.

③ Means extremes product of proportion

④ Same as #2

⑤ Same as #3

⑥ addition property

⑦ distributive property

⑧ segment addition property

⑨ Substitution

⑩ power property