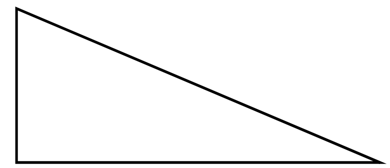
Finish the Pythagorean Theorem proof assignment:

Theorem 68 (Pythagorean Theorem): Given a right triangle with legs of length a and b and hypotenuse of length c, then the area of a square constructed on the hypotenuse is equal to the sum of the areas of the squares constructed on the two legs.

Proof: Let ΔABC be a right triangle with $d(B,C)=a$, $d(B,C)=a$, $d(A,B)=c$ and $m\angle ACB = 90°$ [label the triangle]



[fill in the blanks with an axiom or theorem]

By__________________, we can extend side $\overline{CB}$ to $\overline{CD}$ where $B \in \overline{CD}$ and $d(C,D)=a+b$

By_________________, we can construct a square $CDEF$ where one side is $\overline{CD}$. Without loss in generality we may assume $A \in \overline{CF}$.

By ________________, we can find points G and H, such that $G \in \overline{FE}$ such that $d(F,G)=b$ and $H \in \overline{ED}$ such that $d(E,H)=b$.

By _______________: $d(C,B)+d(B,D)=d(C,D)=a+b$, [draw and label the construction below]

$d(C,A)+d(A,F)=d(C,F)=a+b$

$d(F,G)+d(G,E)=d(F,E)=a+b$

$d(E,H)+d(H,D)=d(E,D)=a+b$

So, by substitution and algebra:

$d(A,F)=$ ______ $d(G,E)=$______

$d(H,D)=$ ______ $d(B,D)=$______

And $m\angle ACB = m\angle$ _______

$= m\angle$ _______ $= m\angle$ _______ $= 90°$

Hence, by _________________, [axiom or thm]

$\Delta CAB \cong \Delta FGA \cong \Delta EHG \cong \Delta DBH$

So $GHBA$ is a rhombus because

[prove, using the facts above, that $m\angle ABH = 90°$]

Similarly, $m\angle GAB = m\angle HGA = m\angle BHG = 90°$, and so $GHBA$ is a square

By _______________, $\text{area}(CDEF)=(a+b)^2$

By _______________, $\text{area}(CDEF)=4\cdot\text{area}(\Delta CAB)+\text{area}(GHBA)$

And by ________________ and _________________, $4\cdot\frac{1}{2}a\cdot b+c^2$

By substitution: $(a+b)^2 = 2ab+c^2$ [use algebra to complete to proof that $a^2+b^2=c^2$