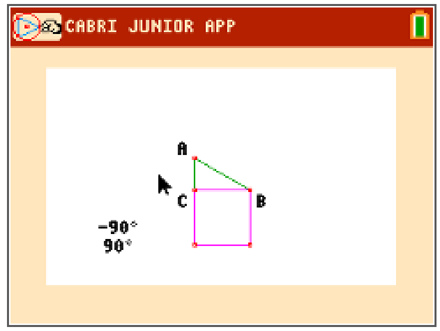
The Pythagorean Theorem
Student Activity

Name ________________

Class ________________

Problem 1 – Squares on Sides Proof

1. Why is the constructed quadrilateral a square?



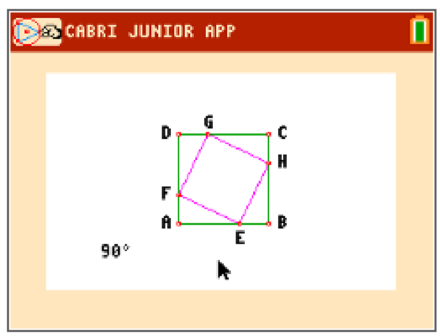
2. Record three sets of area measurements you made by dragging points *A*, *B*, and/or *C*.

Square on $\overline{BC}$	Square on $\overline{AC}$	Sum of squares	Square on $\overline{AB}$

3. What conjecture can you make about the areas of the three squares? Does this relationship always hold when a vertex of $\triangle ABC$ is dragged to a different location?

Problem 2 – Inside a Square Proof

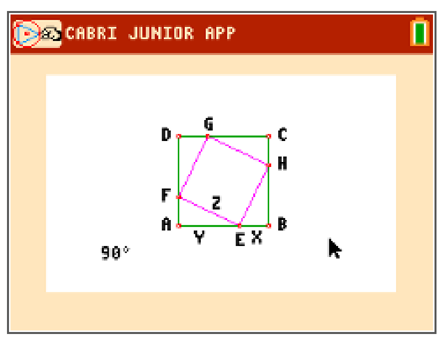
4. Prove that constructed quadrilateral *EFGH* is a square.



5. *ABCD* is a square with all sides of length $(x + y)$.

The area of the square *ABCD* is $(x + y)^2 = x^2 + 2xy + y^2$

Each of the triangles, $\triangle EFA$, $\triangle FGD$, $\triangle GHC$ and $\triangle HEB$, is a right triangle with height *x* and base *y*. So, the area of each triangle is $\frac{1}{2}xy$.



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EFGH is a square with sides of length *z*. So the area of *EFGH* is z^2.

Looking at the areas in the diagram we can conclude that:

ABCD = △EFA + △FGD + △GHC + △HEB + EFGH

Substitute the area expressions (with variables *x*, *y*, and *z*) into the equation above and simplify.

6. Record three sets of numeric values for △*HEB*.

BE	BE^2	HB	HB^2	$BE^2 + HB^2$	EH	EH^2

7. Does $BE^2 + HB^2 = EH^2$ when *E* is dragged to a different location?

8. Does $BE^2 + HB^2 = EH^2$ when *A* or *B* is dragged to a different location?