**Activity 4.5.2b Proving The Right Triangle Similarity Theorem**

In Activity 4.5.1 you may have noticed that the altitude is drawn to the hypotenuse of a right triangle forms similar triangle. We can now state that conjecture as theorem.

**Right Triangle Similarity Theorem:** If the altitude is drawn to the hypotenuse of a right triangle, then the two triangles formed are similar to the original triangle and to each other.

Given: ∆ABC with $∠$*ACB* a right angle
$\overbar{CD}$ is the altitude to $\overbar{AB}$ (and therefore $\overbar{CD}⊥\overbar{AB})$

 Part I: Prove $ΔACB∼ΔADC$

 $∠$\_\_\_\_ $≅∠$\_\_\_\_ because of the reflexive property



 $∠$\_\_\_\_ is a right angle because\_\_\_\_\_\_\_\_\_\_\_\_\_

 $∠$\_\_\_\_ $≅∠$\_\_\_\_ because\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 $ΔACB∼ΔADC$ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Part II: Prove $ΔACB∼ΔCDB$

$∠$\_\_\_\_ $≅∠$\_\_\_\_ because\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 $∠$\_\_\_\_ is a right angle because\_\_\_\_\_\_\_\_\_\_

 $∠$\_\_\_\_ $≅∠$\_\_\_\_ because\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 $ΔACB∼ΔCDB $because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



Part III: Prove $ΔADC∼ΔCDB$

E1.$ m∠ $*ACD* + m$∠ $*BCD* = 90o because\_\_\_\_\_\_\_\_\_\_\_\_

 E2. $m∠ ACD$ + m$∠ $*A* = 90o because\_\_\_\_\_\_\_\_\_\_\_\_

 Use E1 and E2 to show that $m∠ $*A*=$ m∠$\_\_\_\_

 $∠$\_\_\_\_ and $∠$\_\_\_\_ are right angles because\_\_\_\_\_\_\_\_

 $∠$\_\_\_\_ $≅∠$\_\_\_\_ because\_\_\_\_\_\_\_\_

 $ΔADC∼ΔCBD$ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_