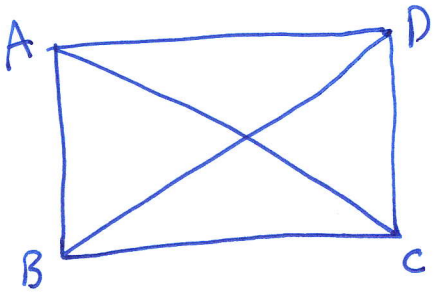
Worked Example – Using Congruent Triangles to Prove Properties of Quadrilaterals

Prove: The diagonals of a rectangle are congruent.

Given: ABCD is a rectangle

Prove: $\overline{AC} \cong \overline{BD}$



Statements	Reasons
① ABCD is a rectangle	① Given
② ∠DAB and ∠ABC are right angles	② Def. of a rectangle. (1)
③ ∠DAB ≅ ∠ABC	③ All right angles are ≅. (2)
④ $\overline{AB} \cong \overline{AB}$	④ Reflexive property of congruence.
⑤ $\overline{AD} \cong \overline{BC}$	⑤ Opposite sides of a parallelogram* are ≅. (1)
⑥ △ABC ≅ △BAD	⑥ S.A.S. (3, 4, 5)
⑦ $\overline{AC} \cong \overline{BD}$	⑦ C.P.C.T.C. (6)

"Corresponding Parts of Congruent Triangles are Congruent" (OR Definition of ≅ △s)

*A rectangle is a parallelogram, so all properties of parallelograms are also properties of rectangles.

Objective: Use congruent triangles to prove properties of quadrilaterals.