## Answer on Question #81448 – Math – Geometry

## Question

ABCD is a quadrilateral with AB equal and parallel to DC.prove that AD is equal and parallel to BC.

## Solution

Given: $AB = CD$ , $AB \parallel CD$ $Pr \ o \ ve : AD = BC$ , $AD \parallel BC$	

**Proof:** 

Statements	Reasons
$AB = CD$ , $AB \parallel CD$	Given
$_2 \angle BAC = \angle ACD$	Alternate Interior Angles Theorem If two parallel lines are cut by a transversal, then each pair of alternate interior angles is congruent
$m \angle BAC \cong m \angle ACD$	Definition of congruent angles
$3 \bigtriangleup ABC = \bigtriangleup ADC$	SAS Side-Angle-Side Congruence If two sides and the included angle of one triangle are congruent to two sides and the included angle of another triangle, then the triangles are congruent.
4 AB = CD	Definition of congruent sides in congruent triangles
5. $\angle ABC = \angle ADC$	Definition of congruent angles
$m \angle ABC \cong m \angle ADC$	Definition of congruent angles
6. AB    CD	If two lines in a plane are cut by a transversal so that a pair of alternate interior angles is congruent, then the lines are parallel.

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