## Answer on Question \#81448 - Math - Geometry

## Question

$A B C D$ is a quadrilateral with $A B$ equal and parallel to DC.prove that $A D$ is equal and parallel to $B C$.

## Solution

Given : $A B=C D$,
AB $\| \mathrm{CD}$
Prove: $A D=B C, A D \| B C$

Proof:

| Statements | Reasons <br> $2 A B=C D, \mathrm{AB} \mathrm{\\|} \mathrm{CD}$ |
| :--- | :--- |
| $2 \angle B A C=\angle A C D$ | Given <br> Alternate Interior Angles Theorem <br> If two parallel lines <br> are cut by a transversal, then each pair of <br> alternate <br> interior angles is congruent |
| $m \angle B A C \cong m \angle A C D$ | Definition of congruent angles |
| $3 \triangle A B C=\triangle A D C$ | SAS <br> Side-Angle-Side Congruence If two sides and <br> the included angle of one triangle are congruent <br> to two sides and the included angle of another <br> triangle, then the triangles are congruent. |
| $4 A B=C D$ | Definition of congruent sides in congruent <br> triangles |
| $5 . \angle A B C=\angle A D C$ | Definition of congruent angles |
| $m \angle A B C \cong m \angle A D C$ | Definition of congruent angles <br> that a paines in a plane are cut by a transversal so <br> congruent, then the lines are parallel. |
| $6 . \mathrm{AB} \\| \mathrm{CD}$ |  |

