

Prove These Sides are Congruent

According to the definition of a parallelogram, the opposite sides of a quadrilateral are parallel. We often deduce that these opposite sides are also congruent. In this video, we will construct the proof that verifies this statement.

When constructing a proof, it is important to have a diagram on which to draw. If a diagram is not given, you should create one. In this case we have one, so will first begin with the given information – quadrilateral ABCD is a parallelogram... We need to prove that side AD is congruent to side BC – this will be the final statement of the proof. By definition, we know that side AD is parallel to side BC... Additionally, if we look at the parallelogram a bit differently, we see that the diagonal BD acts like a transversal that cuts across parallel lines... This means angle ADB is congruent to angle CBD by the alternate interior angles theorem... Similarly, segment AB is parallel to segment CD, and angle CDB is congruent to angle ABD... Segment BD is a part of two newly formed triangles on the interior of our parallelogram. Segment BD must be congruent to itself by the reflexive property... Looking closely at our diagram, we should now see that we have two triangles that have two pairs of angles and a pair of included sides that are congruent. Therefore, triangle ABD is congruent to triangle CDB by the ASA Congruence Postulate. Finally, segment AD must be congruent to BC because corresponding parts of congruent triangles are always congruent.

Be sure to watch, and practice this proof technique in case you have to create one that is similar on your own. Good Luck!