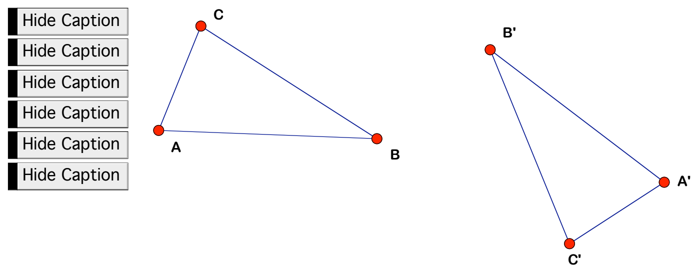
Theorem 16.(ASA) If two triangles have two angles and the side between them equal, then triangles are congruent.



Denote the triangles as △ABC and △A'B'C'. We assume that ∠A=∠A',∠B=∠B' and |AB|=|A'B'|.

Proof:	Reasons:
1. There exists an isometry f that maps ∠A onto ∠A', moreover ray AB onto A'B', ray AC onto A'C'.	1. Theorem 15, part c).
2. f(A)=A'	2. The point A is the intersection of the lines AB and AC. They are mapped to lines A'B' and A'C'. The point of intersection of AB and AC is mapped to the point of intersection of A'B' and A'C'.
3. |A'B'|=|A'f(B)|	3. |A'B'|=|AB|=|f(A)f(B)|=|A'f(B)|
4. f(B)=B'	4. From the statement 3. and Theorem 14 follows that points f(B) and B' are the same point.
5. Rays BC and AC lie on the same of the line AB.	5. They lie on the same side as the point C.
6. Rays f(BC)=B'f(C) and f(AC)=A'f(C) lie on the same side of A'B'.	6. By Theorem 8, halfplanes are mapped to halfplanes. By statement 5 BC and AC are in the same halfplane with AB as the boundary. Hence, their images are also in the same halfplane with the boundary f(AB)=A'B'
7. Rays B'f(C) and A'C' lie on the same side of A'B'.	7. It is given to us that the f(AC)=A'C'.
8. Rays B'f(C) and A'C' lie on the same side of A'B'.	8. It follows from statements 6 and 7.
9. ∠ABC=∠A'B'C'	9. It is given.
10. ∠A'B'f(C)=∠A'B'C'	10. ∠A'B'C'=∠ABC=f(∠ABC)=∠A'B'f(C)
11. Ray f(BC)= ray B'C'.	11. ∠A'B'C' = ∠A'B'f(C) and rays B'C' and B'f(C) on the side of A'B'. We can apply Corollory 15.1.
5. f(C)=C'	12. The point C is the intersection of the lines AC and BC. Hence f(C) is the intersection of the lines f(AC) and f(BC). But lines f(AC)=A'C' and f(BC)=B'C'. They intersect at the point C'. Hence f(C)=C'.