

# Theorems of Segment and Angle Congruence // More Flow Chart Proofs

## Lesson Objective

**Theorem:** A theorem is a statement that can be proven.

→ Once you have proven a theorem, you can use it as a reason in other proofs.

Property of Segment Congruence	Explanation
Reflexive	
Symmetric	
Transitive	

Property of Angle Congruence	Explanation
Reflexive	
Symmetric	
Transitive	

*Example*

1. Prove the Symmetric Property of Congruence.

Given  $\overline{LM} \cong \overline{NP}$

Prove  $\overline{NP} \cong \overline{LM}$



Provide reasons for all statements given in the flow chart!

$$\overline{LM} \cong \overline{NP}$$



$$LM = NP$$

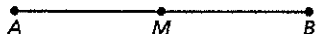


$$NP = LM$$



$$\overline{NP} \cong \overline{LM}$$

2. Prove this property of midpoints: If you know that M is the midpoint of  $\overline{AB}$ , prove that AM is one-half the length of AB.



M is the  
mdpt. of  $\overline{AB}$

given

$\overline{AM} \cong \overline{MB}$

if segs  $\cong \rightarrow$  segs =

seg. add.  
post.

$AB = AM + AM$

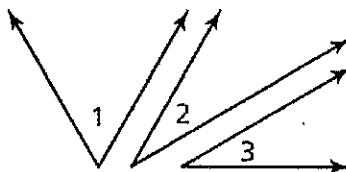
simplify

$\frac{1}{2} AB = AM$

Fill out the  
missing statements  
or reasons for  
each part of  
the flow chart

3. Given  $\angle 1$  is a complement of  $\angle 2$ .  
 $\angle 2 \cong \angle 3$

Prove  $\angle 1$  is a complement of  $\angle 3$ .



given

if  $\angle$ 's  $\cong \rightarrow \angle$ 's =

given

if complementary  $\rightarrow \angle$ 's add to  $90^\circ$

substitution prop. =

if  $\angle$ 's add to  $90^\circ \rightarrow$  complementary

Give each reason  
the appropriate  
statement to  
finish the flow  
chart