

Name _____

Date _____

Period 6

More Proofs

Lesson Objective

INBAT write flow chart proofs
and 2-column proofs.

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.

Flow Chart Proofs

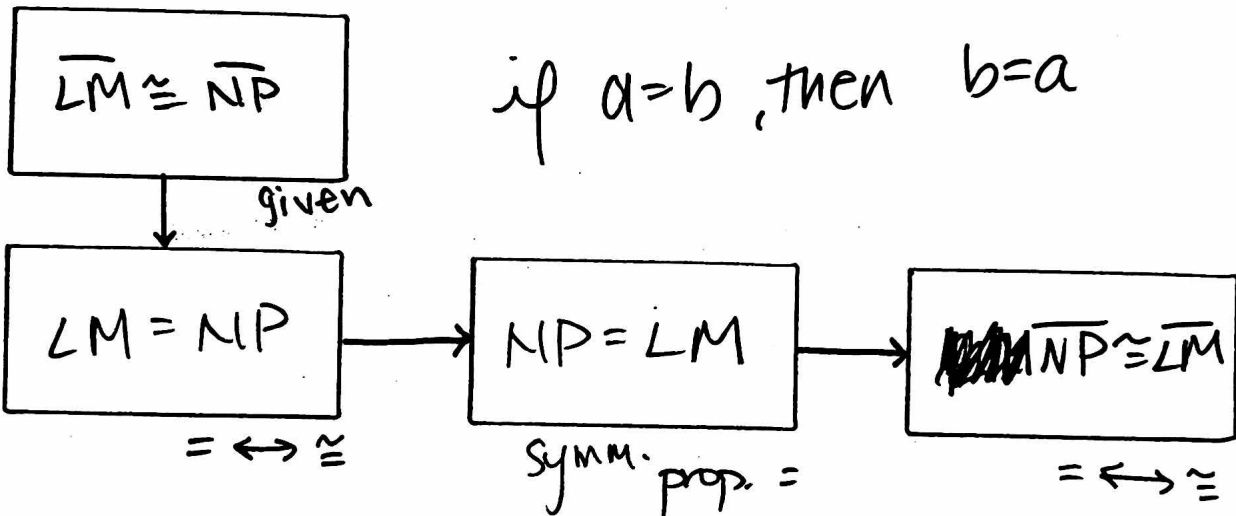
A flow chart proof uses boxes and arrows to show the flow of a logical argument. Each reason is below the statement it justifies.

Examples:

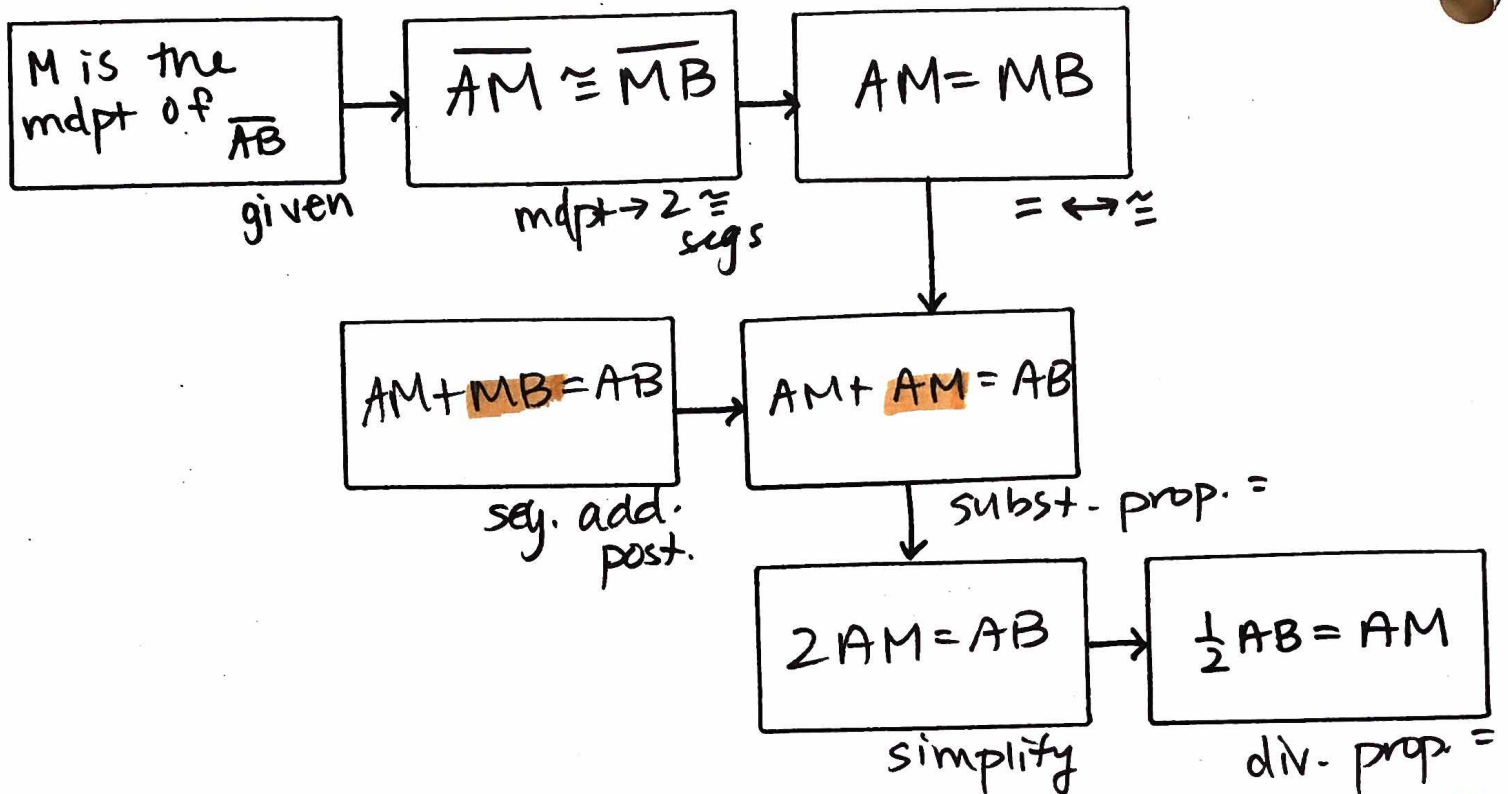
1. Prove the Symmetric Property of Congruence.

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

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



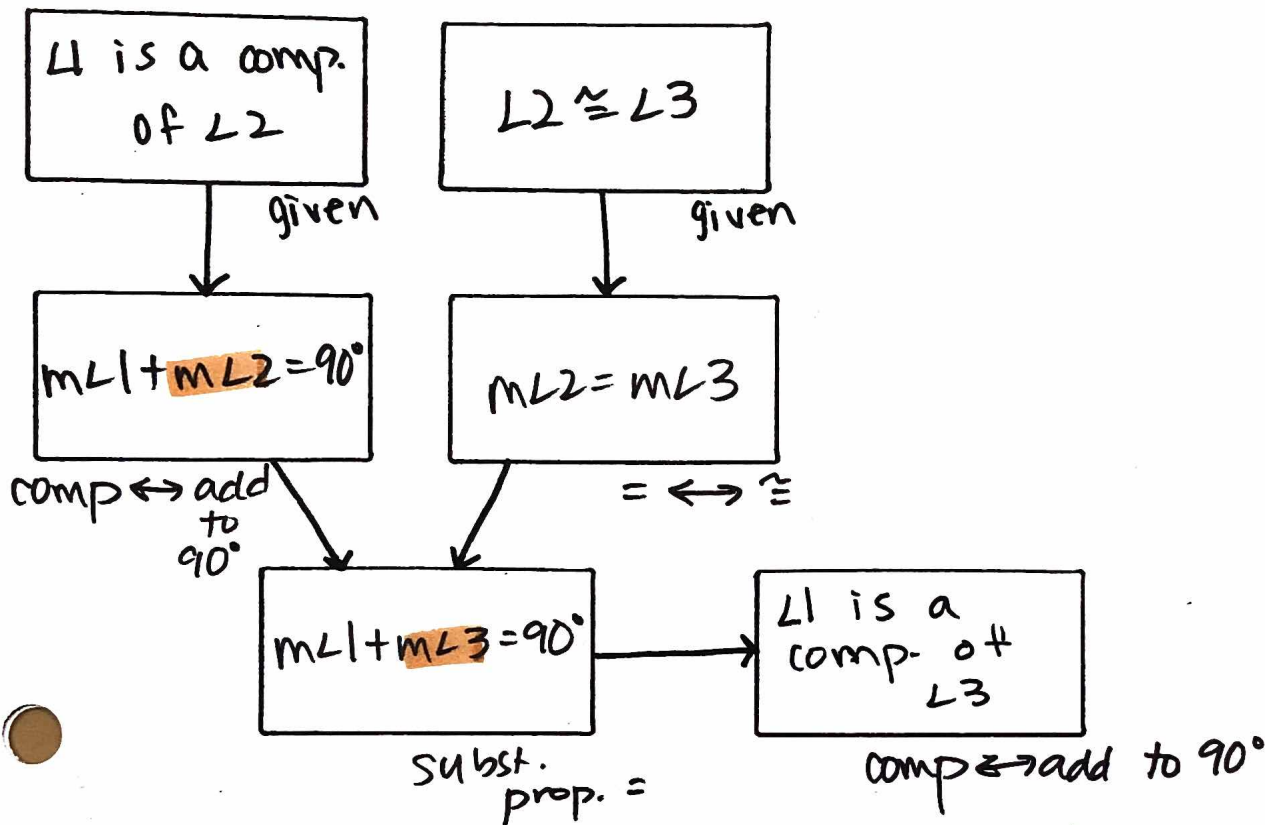
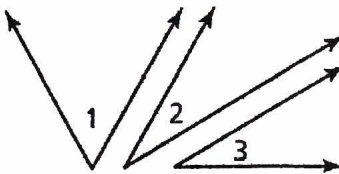
2. Prove this property of midpoints: If you know that M is the midpoint of $\overline{AB}$, prove that AM is one-half the length of AB.



Statements	Reasons
① M is mdpt of $\overline{AB}$	① given
② $\overline{AM} \cong \overline{MB}$	② mdpt $\rightarrow 2 \cong$ segs.
③ $AM = MB$	③ $= \leftrightarrow \cong$
④ $AM + MB = AB$	④ seg. add. post.
⑤ $AM + AM = AB$	⑤ subst. prop. = (step 3 into step 4)
⑥ $2AM = AB$	⑥ simplify
⑦ $AM = \frac{1}{2}AB$	⑦ div. prop. =

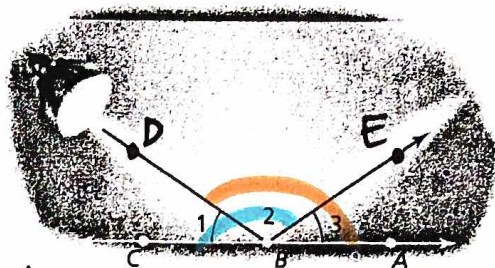
3. Given $\angle 1$ is a complement of $\angle 2$.
 $\angle 2 \cong \angle 3$

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



Statements	Reasons
① $\angle 1$ comp $\angle 2$ $\angle 2 \cong \angle 3$	① given
② $m\angle 1 + m\angle 2 = 90^\circ$	② comp $\leftrightarrow$ add to 90°
③ $m\angle 2 = m\angle 3$	③ $= \leftrightarrow \cong$
④ $m\angle 1 + m\angle 3 = 90^\circ$	④ subst. prop. = (step 3 into step 2)
⑤ $\angle 1$ comp $\angle 3$	⑤ comp $\leftrightarrow$ add to 90°

2. You reflect the beam of a spotlight off a mirror lying flat on a stage, as shown. Determine whether $m\angle DBA = m\angle EBC$.



S	R
① $\angle 1 \cong \angle 3$ ② $m\angle DBA = m\angle 2 + m\angle 3$ $m\angle EBC = m\angle 1 + m\angle 2$ ③ $m\angle 1 = m\angle 3$ ④ $m\angle DBA = m\angle 2 + m\angle 1$ ⑤ $m\angle DBA = m\angle EBC$	① given (arcs in diagram) ② angle add. post. ③ $= \leftrightarrow \cong$ ④ subst. prop. = (step 3 into step 2) ⑤ trans. prop. =

3. A park, a shoe store, a pizza shop, and a movie theater are located in order on a city street. The distance between the park and the shoe store is the same distance between the pizza shop and the movie theater. Show that the distance between the park and the pizza shop is the same as the distance between the shoe store and the movie theater.

Show that the distance between the park and the pizza shop is the same as the distance between the shoe store and the movie theater.

Given:

$$PS = ZM$$

S

R

prove:

$$PZ = SM$$

① $PS = ZM$

② $PS + SZ = PZ$

$ZM + SZ = SM$

③ $ZM + SZ = PZ$

④ $PZ = SM$

① given

② seg. add. post.

③ subst. prop. =

④ trans. prop. =