

Writing Flow Chart Proofs // Theorems about Angle Relationships

Lesson Objective

INBAT write flow chart proofs to prove theorems about angle measures.

Right Angles Congruence Theorem: All right angles are congruent. (if rt. $\angle$'s $\rightarrow \angle$'s $\cong$)

$\rightarrow$ PROOF: See HW #2-8, problem #3!

Congruent Supplements Theorem: If two angles are supplementary to the same angle, (or two congruent angles), then those angles are congruent. ($\cong$ supps. thm)

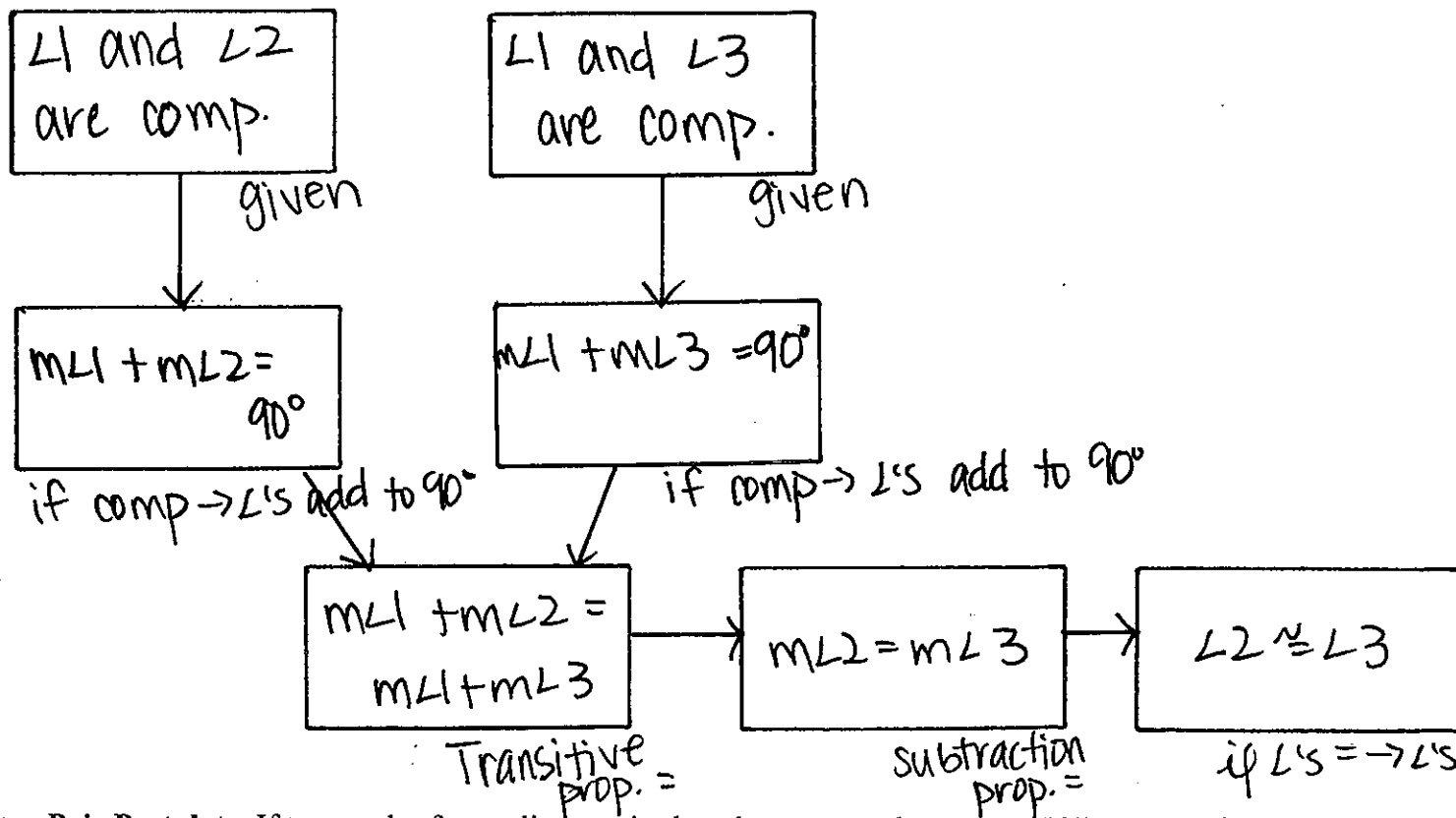
$\rightarrow$ PROOF: See HW #2-8, problem #4!

Congruent Complements Theorem: If two angles are complementary to the same angle, (or two congruent angles), then those angles are congruent. ($\cong$ comps. thm)

$\rightarrow$ PROOF: Use the above proof from HW #2-8 to help you write the flow chart proof for this theorem.

Given: $\angle 1$ and $\angle 2$ are complementary, $\angle 1$ and $\angle 3$ are comp.

Prove: $\angle 2 \cong \angle 3$

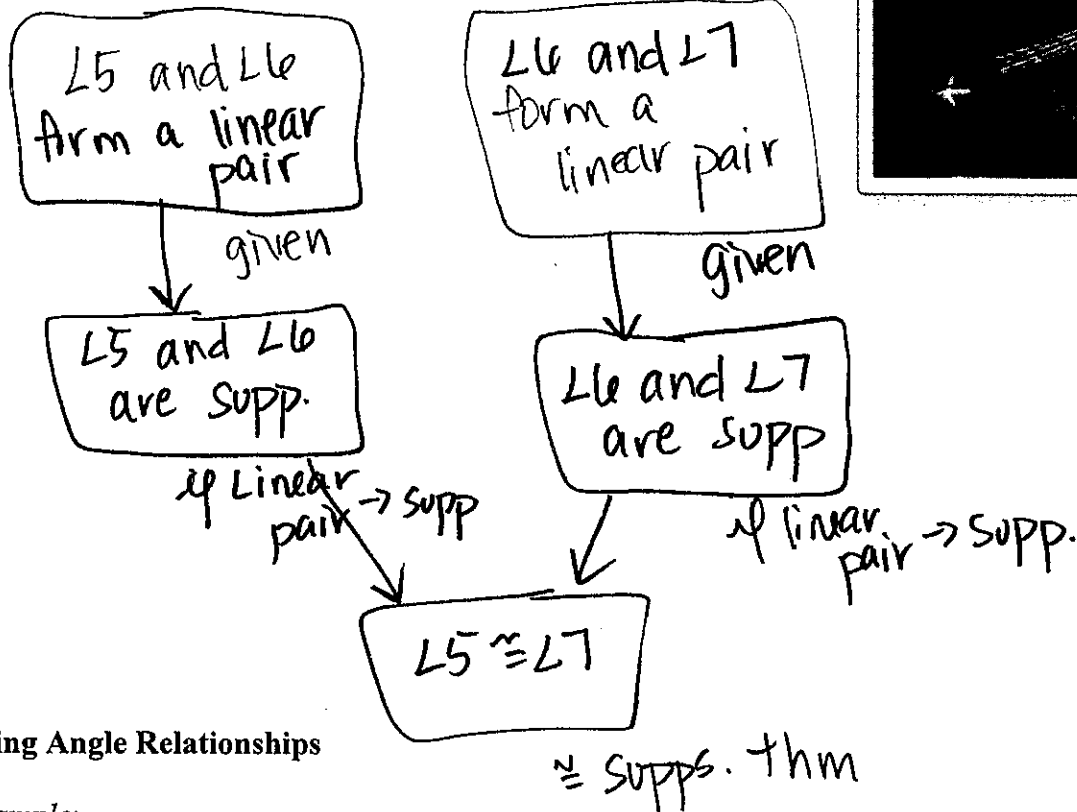
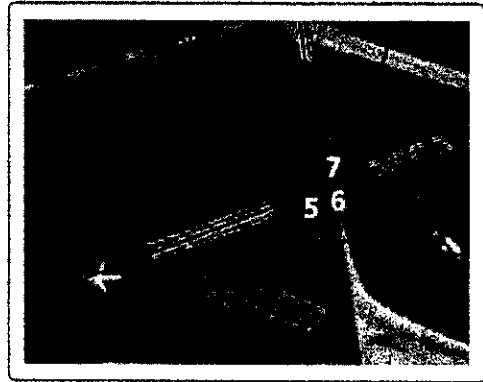


Linear Pair Postulate: If two angles form a linear pair, then they are supplementary. (if linear pair $\rightarrow$ supp.)

$\rightarrow$ Remember, postulates are accepted without needing a proof! ☺

Vertical Angles Congruence Theorem: Vertical angles are congruent. (if vertical $\angle$'s $\rightarrow \angle$'s $\cong$)

$\rightarrow$ PROOF: Given: $\angle 5$ and $\angle 7$ are vertical angles
 Prove: $\angle 5 \cong \angle 7$
 **HINT: Use the linear pair postulate, and another theorem from the front side $\odot$

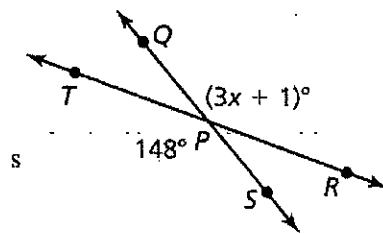


Using Angle Relationships

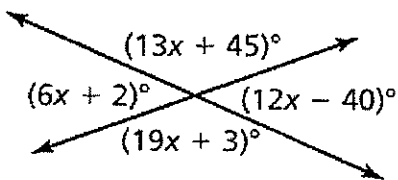
Example:

- Find the value of x . Start your work with a letter equation.

$$\begin{aligned} m\angle QPR &= m\angle SPT \\ 3x + 1 &= 148 \\ 3x &= 147 \\ \boxed{x = 49} \end{aligned}$$



- Describe and correct the error in using the diagram to find the value of x .



a. ~~X~~

$$\begin{aligned} (13x + 45)^\circ + (19x + 3)^\circ &= 180^\circ \\ 32x + 48 &= 180 \\ 32x &= 132 \\ x &= 4.125 \end{aligned}$$

vertical $\angle$'s are $=$,
 not supp.
 $13x + 45 = 19x + 3$

b. ~~X~~

$$\begin{aligned} (13x + 45)^\circ + (12x - 40)^\circ &= 90^\circ \\ 25x + 5 &= 90 \\ 25x &= 85 \\ x &= 3.4 \end{aligned}$$

linear pair $\angle$'s are
 supp, not comp.
 $13x + 45 + 12x - 40 = 180$