Name Key Date _____ Period _____

Writing Flow Chart Proofs // Theorems about Angle Relationships

Lesson Objective

WRITE FLOW CHART PROOFS TO PROVE THEOREMS ABOUT ANGLE MEASURES.

Right Angles Congruence Theorem: All right angles are congruent. (if rt. ∠'s → ∠s' ≅)

→ PROOF: p.106 EXAMPLE 1

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

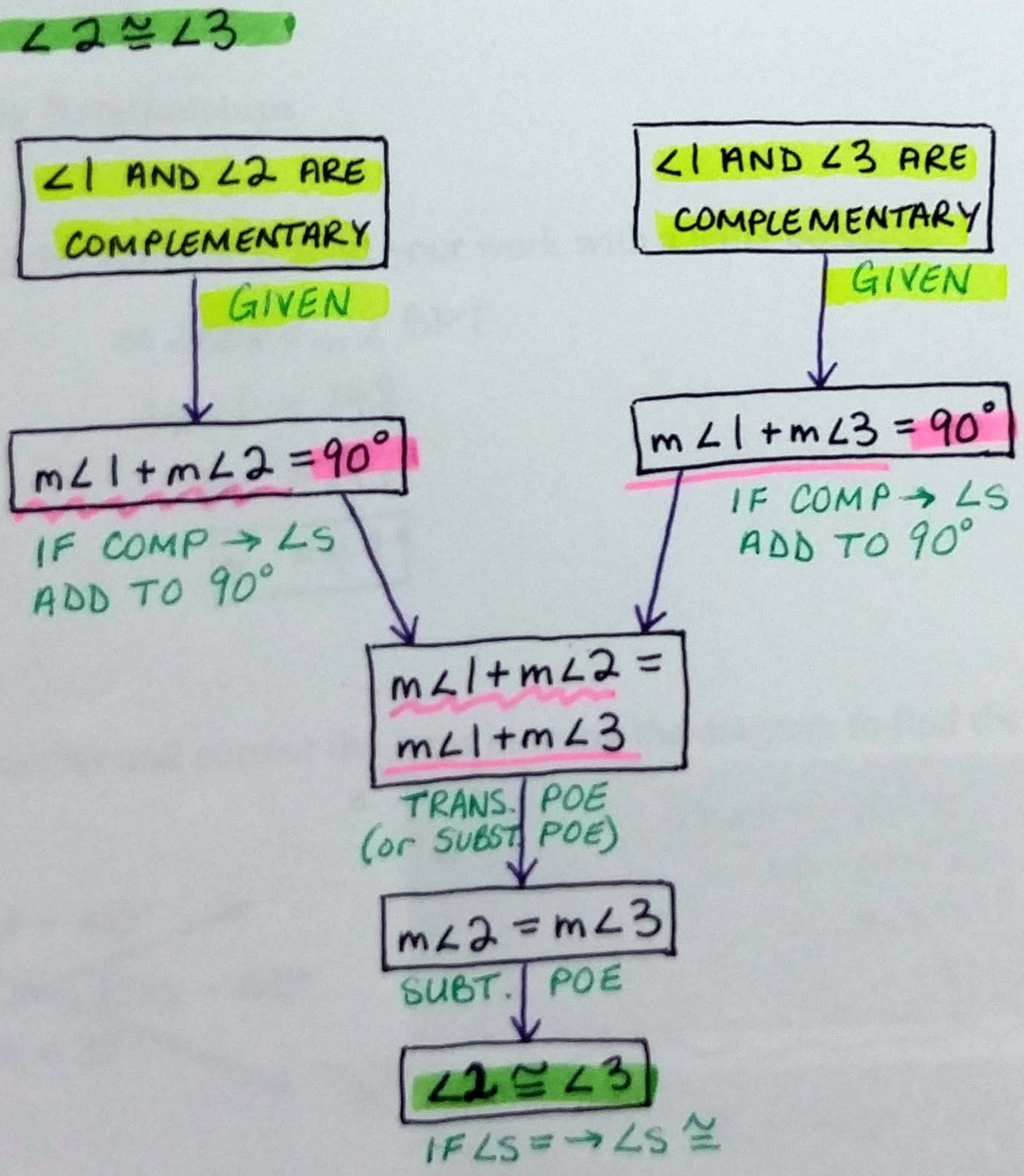
→ PROOF: p.107 EXAMPLE 2

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

→ PROOF: SIMILAR TO PROOF FOR CONGRUENT SUPPLEMENTS THEOREM

Given: ∠1 AND ∠2 ARE COMPLEMENTARY, ∠1 AND ∠3 ARE COMPLEMENTARY

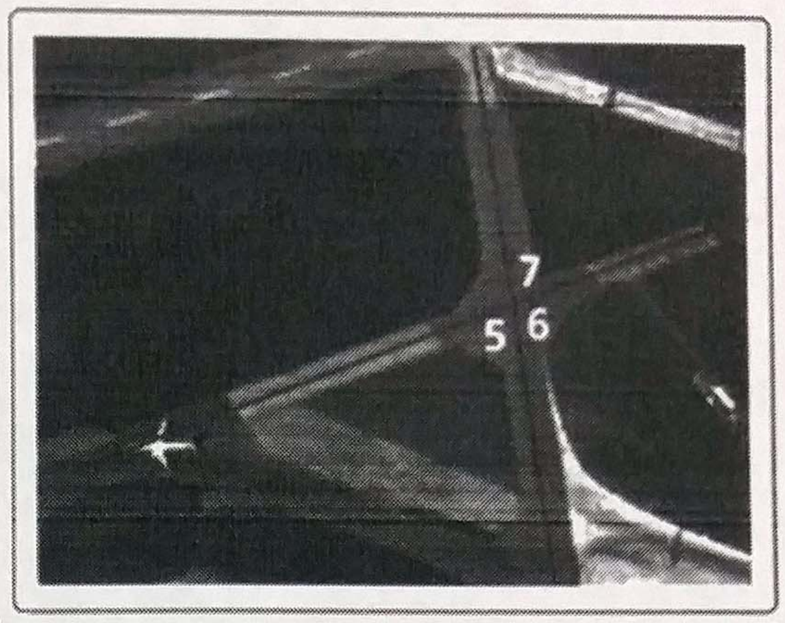
Prove: ∠2 ≅ ∠3



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

→ Remember, postulates are accepted without needing a proof! ☺

Vertical Angles Congruence Theorem: Vertical angles are congruent. (if vertical ∠'s → ∠'s ≅)



➔ PROOF: **Given:** ∠5 and ∠7 are vertical angles
Prove: ∠5 ≅ ∠7
***HINT: Use the linear pair postulate, and another theorem from the front side ☺*

∠5 AND ∠7 ARE VERTICAL ANGLES
GIVEN

DID NOT END UP BEING NECESSARY IN THIS PROOF!

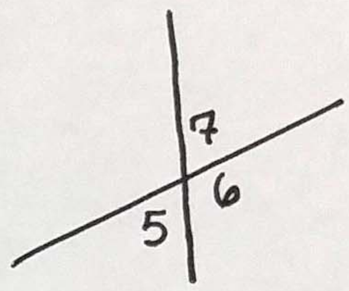
∠5 AND ∠6 FORM A LINEAR PAIR
GIVEN

∠5 AND ∠6 ARE SUPP.
IF LINEAR PAIR → SUPP.

∠6 AND ∠7 FORM A LINEAR PAIR
GIVEN

∠6 AND ∠7 ARE SUPP.
IF LINEAR PAIR → SUPP.

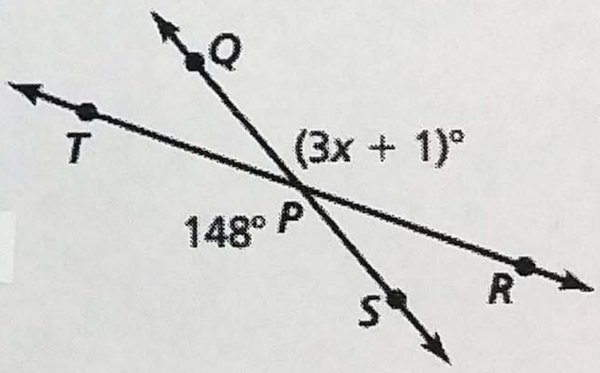
∠5 ≅ ∠7 ✓
≅ SUPPS. THM



Using Angle Relationships

Example:

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



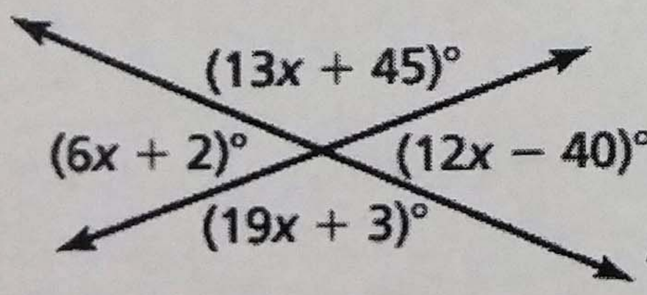
$m\angle QPR = m\angle SPT$

$3x + 1 = 148$

$3x = 147$

$\boxed{x = 49}$

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



a.

✗ $(13x + 45)° + (19x + 3)° = 180°$
$32x + 48 = 180$
$32x = 132$
$x = 4.125$

VERTICAL ∠S ARE =, NOT SUPP.
$13x + 45 = 19x + 3$
$42 = 6x$
$7 = x$

b.

✗ $(13x + 45)° + (12x - 40)° = 90°$
$25x + 5 = 90$
$25x = 85$
$x = 3.4$

LINEAR PAIR ∠S ARE SUPP. NOT COMP.
$13x + 45 + 12x - 40 = 180$
$25x + 5 = 180$
$25x = 175$
$x = 7$