2.4 Congruent Supplements and Complements.

Objective: Prove angles congruent by means of FOUR new theorems

Supplementary Angle Theorems

Theorem 4: If angles are supplementary to the <u>same</u> angle, then they are congruent. *Theorem 5:* If angles are supplementary to *congruent* angles, then they are congruent.





Statements	Reasons
1. 41 is supplementary to 42	1. Given
2. 43 is supplementary to 44	2. Given
3. $m \neq 1 + m \neq 2 = 180, m \neq 3 + m \neq 4 = 180$	3. If 2 $\not 4s$ are supp, then their sum = 180
4. $m \neq 1 + m \neq 2 = m \neq 3 + m \neq 4$	4. Substitution (180 = 180)
5. m₄2 = m₄3	5. Given
6. m≰1 = m≰4 ◀	6. Subtraction Property
7. ≰ 1 ≅ ≰ 4	7. If two angles have the same measure, then
	they are congruent

Complementary Angle Theorems

Theorem 6: If angles are complementary to the <u>same</u> angle, then they are congruent. *Theorem 7:* If angles are complementary to *congruent* angles, then they are congruent.

Proof of Th^m 6: Complements to the Same Angle are Congruent Α С В

Given: $\measuredangle A$ is complementary to $\measuredangle B$ $\angle C$ is complementary to $\angle B$ **Prove:** $\measuredangle A \cong \measuredangle C$

Statements	Reasons
1 . ≰A is complementary to ≰B	1. Given
2. 4 C <i>is complementary to</i> 4 B	2. Given
3. $m \not A + m \not A = 90; m \not A - m \not A = 90$	3. If 2 ∡s are comp, then their sum = 90
4. $m \neq B = m \neq B$	4. Reflexive Property
5. m₄A = m₄C ◀	5. Subtraction Property (90 - m <i>4</i> B)
6. 46	6 If two angles have the same measure, then they are
	congruent.