

# Section 2-8: Angle Proofs- Notes

## THEOREM 2.5

Congruence of angles is reflexive, symmetric, and transitive.

**Reflexive Property**  $\angle 1 \cong \angle 1$

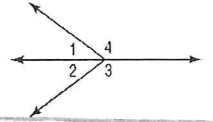
**Symmetric Property** If  $\angle 1 \cong \angle 2$ , then  $\angle 2 \cong \angle 1$ .

**Transitive Property** If  $\angle 1 \cong \angle 2$ , and  $\angle 2 \cong \angle 3$ , then  $\angle 1 \cong \angle 3$ .

EX1.

Given:  $\angle 1$  and  $\angle 4$  are a linear pair  
 $m\angle 3 + m\angle 1 = 180$

Prove:  $\angle 3$  and  $\angle 4$  are congruent

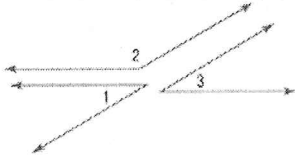


## THEOREMS

2.6 Angles supplementary to the same angle or to congruent angles are congruent.

Abbreviation:  $\Delta$  suppl. to same  $\angle$  or  $\cong \Delta$  are  $\cong$ .

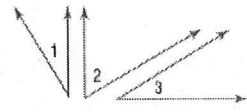
Example: If  $m\angle 1 + m\angle 2 = 180$  and  $m\angle 2 + m\angle 3 = 180$ , then  $\angle 1 \cong \angle 3$ .



2.7 Angles complementary to the same angle or to congruent angles are congruent.

Abbreviation:  $\Delta$  compl. to same  $\angle$  or  $\cong \Delta$  are  $\cong$ .

Example: If  $m\angle 1 + m\angle 2 = 90$  and  $m\angle 2 + m\angle 3 = 90$ , then  $\angle 1 \cong \angle 3$ .



1.  $\angle 1$  and  $\angle 4$  are linear pairs

$$\angle 3 + \angle 1 = 180$$

$$2. \angle 1 + \angle 4 = 180$$

$$3. \angle 3 + \angle 1 = \angle 1 + \angle 4$$

$$4. \angle 3 \cong \angle 4$$

1. Given

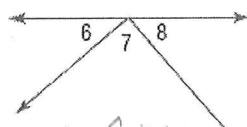
2. linear pairs are suppl.

3. Substitution

4.) subtracting

EX2.

Prove: If  $\angle 6$  and  $\angle 8$  are complementary, the  $\angle 7$  is a right angle.



1.  $\angle 6$  and  $\angle 8$  are compl.
2.  $\angle 6 + \angle 8 = 90$
3.  $\angle 6 + \angle 7 + \angle 8 = 180$
4.  $90 + \angle 7 = 180$
5.  $\angle 7 = 90$
6.  $\angle 7$  is a right angle

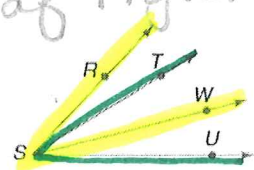
1. Given
2. def of compl
3. angles on a straight line
4. Substitution
5. subtraction
6. def of right angle

EX 3.

Given:  $m\angle RSW = m\angle TSU$

Prove:  $m\angle RST = m\angle WSU$

1.  $\angle RSW = \angle TSU$
2.  $\angle RSW = \angle RST + \angle TSW$   
 $\angle TSU = \angle TSW + \angle WSU$
3.  $\angle RST + \angle TSW = \angle TSW + \angle WSU$   
 $= \angle TSW - \angle TSW$
4.  $\angle RST = \angle WSU$



1. Given
2. angle addition  
 Introduce  $\angle RST + \angle WSU$  by picture
3. Substitution (step 1)  $\leftarrow$  yellow = green
4. Subtraction

