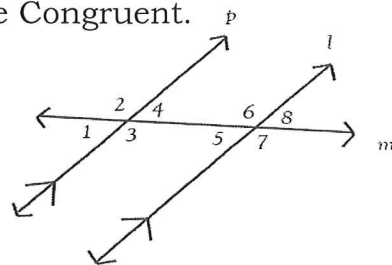


## Proving Angle Relationships: Notes

Use Alternate Exterior Angles to prove **Alternate Interior Angles** are Congruent.

**Given:**  $p \parallel l$  and  $m$  is a transversal of  $p$  and  $l$

**Prove:**  $\angle 4 \cong \angle 5$



1.  $p \parallel l$  and  $m$  is a transversal of  $p$  and  $l$

2.  $\angle 1 \cong \angle 8$

3.  $\angle 1 \cong \angle 4$ ,  $\angle 8 \cong \angle 5$

4.  $\angle 4 \cong \angle 8$

5.  $\angle 4 \cong \angle 5$

1. given

2. alt. ext.  $\angle$ s are  $\cong$

3. vertical  $\angle$ s are  $\cong$

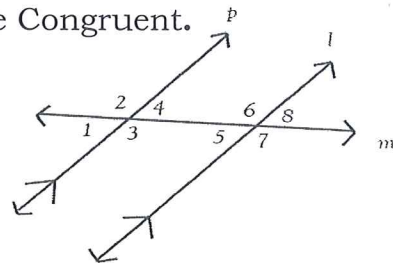
4. Substitution

5. substitution (or transitive)

Use Alternate Exterior Angles to prove **Corresponding Angles** are Congruent.

**Given:**  $p \parallel l$  and  $m$  is a transversal of  $p$  and  $l$

**Prove:**  $\angle 2 \cong \angle 6$



1.  $p \parallel l$  and  $m$  is a transversal of  $p$  and  $l$

2.  $\angle 2 \cong \angle 7$

3.  $\angle 7 \cong \angle 6$

4.  $\angle 2 \cong \angle 6$

1. given

2. alt. ext.  $\angle$ s are  $\cong$

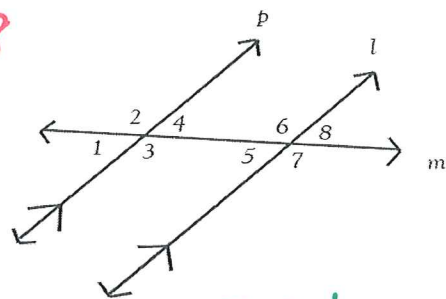
3. vertical  $\angle$ s are  $\cong$

4. substitution (or transitive)

Prove Consecutive Interior Angles are supplementary.

**Given:**  $p \parallel l$  and  $m$  is a transversal of  $p$  and  $l$ ,  $\angle 1 \cong \angle 8$

**Prove:**  $\angle 3$  and  $\angle 5$  are supplementary



1.  $p \parallel l$  +  $m$  is a transversal of  $p$  and  $l$

$$\angle 1 \cong \angle 8$$

$$2. \angle 1 + \angle 3 = 180$$

$$3. \angle 8 \cong \angle 5$$

$$4. \angle 8 + \angle 3 = 180$$

$$5. \angle 5 + \angle 3 = 180$$

1. given

2. linear pairs are suppl.

3. vertical  $\angle$ s are  $\cong$

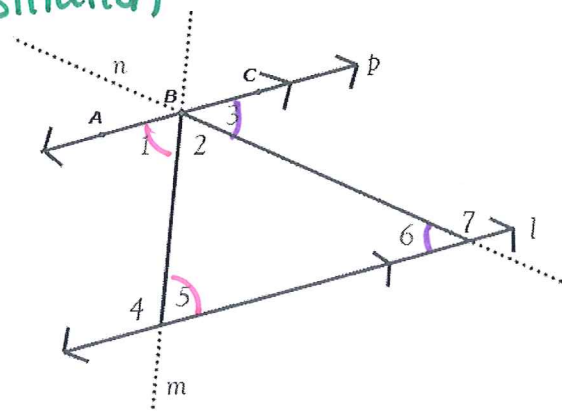
4. substitution

5. substitution

Prove the Triangle Sum Theorem

**Given:**  $p \parallel l$  and  $m$  is a transversal of  $p$  and  $l$

**Prove:**  $m \angle 5 + m \angle 2 + m \angle 6 = 180$



1.  $p \parallel l$

$m$  is a transversal of  $p$  +  $l$

$$2. \angle 1 + \angle 2 + \angle 3 = 180$$

$$3. \angle 1 \cong \angle 5$$

$$\angle 3 \cong \angle 6$$

$$4. \angle 5 + \angle 2 + \angle 6 = 180$$

1. given

2. def. of straight angle (with angle addition)

3. alt. int.  $\angle$ s are  $\cong$

4. substitution