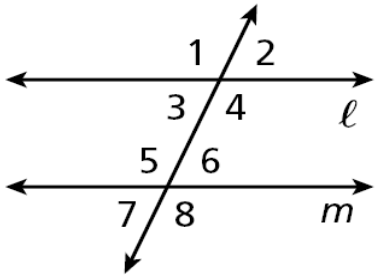
Unit 4 Facts
Parallel Lines Proofs

Corresponding Angles Theorem	**If two parallel lines are cut by a transversal, then the pairs of corresponding angles are congruent.**
Alternate Interior Angles Theorem	**If two parallel lines are cut by a transversal, then the pairs of alternate interior angles are congruent.**
Alternate Exterior Angles Theorem	**If two parallel lines are cut by a transversal, then the pairs of alternate exterior angles are congruent.**
Same-Side Interior Angles Theorem	**If two parallel lines are cut by a transversal, then the pairs of same-side interior angles are supplementary.**
Same-Side Exterior Angles Theorem	**If two parallel lines are cut by a transversal, then the pairs of same-side exterior angles are supplementary.**

Stand Alone Angle Relationships:

- **Vertical Angles** are always congruent.
- **Linear Pair** are always supplementary



Angle Relationships based on Parallel Lines

Angles Relationship	Type
$\angle 1 \cong \angle 5, \angle 3 \cong \angle 7$ $\angle 2 \cong \angle 6, \angle 4 \cong \angle 8$	**Corresponding**
$\angle 3 \cong \angle 6, \angle 4 \cong \angle 5$	**Alternate Interior**
$\angle 1 \cong \angle 8, \angle 2 \cong \angle 7$	**Alternate Exterior**
$\angle 3 \& \angle 5$ *are supplements* $\angle 4 \& \angle 6$ *are supplements*	**Same Side Interior**
$\angle 1 \& \angle 7$ *are supplements* $\angle 2 \& \angle 8$ *are supplements*	**Same Side EXterior**

Converse of Corresponding Angles Theorem	**If the pairs of corresponding angles are congruent, then the two lines cut by a transversal are parallel.**
Converse of Alternate Interior Angles Theorem	**If the pairs of alternate interior angles are congruent, then the two lines cut by a transversal are parallel.**
Converse of Alternate Exterior Angles Theorem	**If the pairs of alternate exterior angles are congruent, then the two lines cut by a transversal are parallel.**
Converse of Same-Side Interior Angles Theorem	**If the pairs of same side interior angles are supplementary, then the two lines cut by a transversal are parallel.**
Converse of Same-Side Exterior Angles Theorem	**If the pairs of same side exterior angles are supplementary, then the two lines cut by a transversal are parallel.**

Slopes

- Parallel lines have the same slope.
- Perpendicular lines have slopes that are opposite reciprocals. If you multiplied them together you would get -1.

Other theorems to use in proofs:

- **Vertical Angles Congruence Thm:** Vertical angles are congruent.
- **Right Angles Congruence Thm:** All right angles are congruent.
- **Linear Pair Thm:** If two angles form a linear pair, then they are supplementary.
- **Congruent Complements Thm:** If two angles are complementary to the same angle or congruent angles, then the angles are congruent.
- **Congruent Supplements Thm:** If two angles are supplementary to the same angle or congruent angles, then the angles are congruent.