

## Common Core Geometry Proof – Lines and Angles\_2

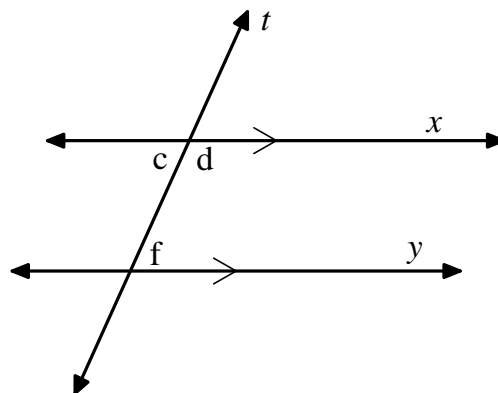
### Alternate Interior Angles

**Theorem:** If two parallel lines are cut by a transversal, then the alternate interior angles formed are congruent.

**Given:**  $x \parallel y$  cut by transversal  $t$

**Prove:**  $\angle c \cong \angle f$

**Diagram:**



Statements	Reasons
1. $x \parallel y$ cut by transversal $t$	1. Given
2. $\angle c$ and $\angle d$ form a linear pair	2. Definition of Linear Pair
3. $\angle c$ and $\angle d$ are supplementary	3. Theorem: If two angles form a linear pair, then they are supplementary.
4. $m\angle c + m\angle d = 180^\circ$	4. Definition of Supplementary Angles
5. $\angle d$ and $\angle f$ are supplementary	5. Same Side Interior Angles Postulate
6. $m\angle d + m\angle f = 180^\circ$	6. Definition of Supplementary Angles
7. $m\angle c + m\angle d = m\angle d + m\angle f$	7. Substitution Axiom
8. $m\angle c = m\angle f$	8. Subtraction Axiom
9. $\angle c \cong \angle f$	9. Definition of Congruence