Explorations

These exploratory exercises can be done using a computer with a program that draws and measures geometric figures.

Draw two parallel segments and a transversal and label the points of intersection. Measure all eight angles formed. Repeat several times. Do you notice any patterns? What kinds of angles are congruent? What kinds of angles are supplementary?

3-2 *Properties of Parallel Lines*

By experimenting with parallel lines, transversals, and a protractor in Exercise 18, page 76, you probably discovered that corresponding angles are congruent. There is not enough information in our previous postulates and theorems to deduce this property as a theorem. We will accept it as a postulate.

Postulate 10

If two parallel lines are cut by a transversal, then corresponding angles are congruent.

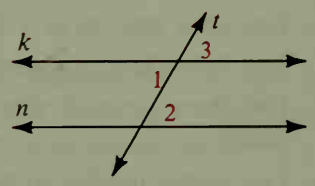
From this postulate we can easily prove the next three theorems.

Theorem 3-2

If two parallel lines are cut by a transversal, then alternate interior angles are congruent.

Given: $k \parallel n$; transversal t cuts k and n.

Prove: $\angle 1 \cong \angle 2$



Proof:

Statements	Reasons
1. $k \parallel n$	1. Given
2. $\angle 1 \cong \angle 3$	2. Vert. $\angle$s are $\cong$.
3. $\angle 3 \cong \angle 2$	3. If two parallel lines are cut by a transversal, then corr. $\angle$s are $\cong$.
4. $\angle 1 \cong \angle 2$	4. Transitive Property