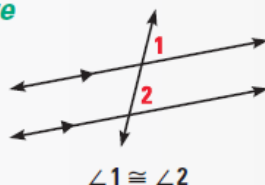# Notes 7.2 Use Parallel Lines and Transversals
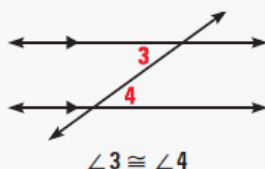
POSTULATE 15 *Corresponding Angles Postulate*

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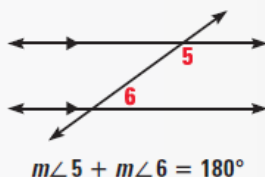

$\angle 1 \cong \angle 2$

THEOREM 3.4 *Alternate Interior Angles*

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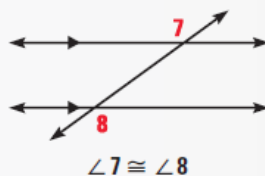

$\angle 3 \cong \angle 4$

THEOREM 3.5 *Consecutive Interior Angles*

If two parallel lines are cut by a transversal, then the pairs of consecutive interior angles are supplementary.

$m\angle 5 + m\angle 6 = 180°$

THEOREM 3.6 *Alternate Exterior Angles*

If two parallel lines are cut by a transversal, then the pairs of alternate exterior angles are congruent.

$\angle 7 \cong \angle 8$

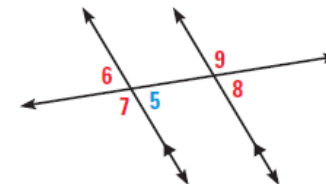**THEOREM 3.7** *Perpendicular Transversal*

If a transversal is perpendicular to one of two parallel lines, then it is perpendicular to the other.

$j \perp k$
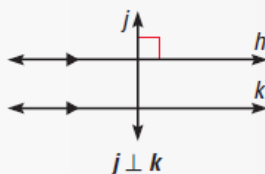
EXAMPLE 2 *Using Properties of Parallel Lines*

Given that $m\angle 5 = 65°$, find each measure. Tell which postulate or theorem you use.

a. $m\angle 6$ b. $m\angle 7$

c. $m\angle 8$ d. $m\angle 9$

SOLUTION

a. $m\angle 6 = m\angle 5 = 65°$	**Vertical Angles Theorem**
b. $m\angle 7 = 180° - m\angle 5 = 115°$	**Linear Pair Postulate**
c. $m\angle 8 = m\angle 5 = 65°$	**Corresponding Angles Postulate**
d. $m\angle 9 = m\angle 7 = 115°$	**Alternate Exterior Angles Theorem**

EXAMPLE 4 *Using Properties of Parallel Lines*

Use properties of parallel lines to find the value of x.

SOLUTION

$m\angle 4 = 125°$	**Corresponding Angles Postulate**
$m\angle 4 + (x + 15)° = 180°$	**Linear Pair Postulate**
$125° + (x + 15)° = 180°$	**Substitute.**
$x = 40$	**Subtract.**