

1) Given:  $a \parallel b$   
 Prove:  $\angle 1$  and  $\angle 8$  supplementary

2) Given:  $m\angle 2 = m\angle 3 + m\angle 5$   
 Prove:  $m\angle 4 = m\angle 1 + m\angle 5$

$m\angle 2 = m\angle 3 + m\angle 5$	Given
$\angle 1 \cong \angle 3, \angle 2 \cong \angle 4$	Vertical Angles Congruent
$m\angle 1 = m\angle 3,$ $m\angle 2 = m\angle 4$	Def of Congruence
$m\angle 4 = m\angle 1 + m\angle 5$	Substitution

$a \parallel b$	Given
$\angle 1 \cong \angle 5$	Corresponding $\angle$ s Congruent
$m\angle 5 + m\angle 8 = 180$	Angles form a straight line
$m\angle 1 = m\angle 5$	Def of Congruence
$m\angle 1 + m\angle 8 = 180$	Substitution
$\angle 1, \angle 8$ suppl.	Def of Supplementary

3) Given:  $\angle 2 \cong \angle 8$   
 Prove:  $a \parallel b$

4) Given:  $\angle 1$  and  $\angle 8$  supplementary  
 Prove:  $\angle 3 \cong \angle 5$

$\angle 2 \cong \angle 8$	Given
$a \parallel b$	Alternate Exterior Angles

$\angle 1, \angle 8$ suppl	Given
$\angle 5, \angle 8$ suppl	Angles form straight line
$\angle 1 \cong \angle 5$	Suppl to same angle
$\angle 1 \cong \angle 3$	Vertical Angles Congruent
$\angle 3 \cong \angle 5$	Transitive

- 5) Given:  $\angle 1$  and  $\angle 3$  supplementary  
 Prove:  $\angle 2$  and  $\angle 4$  supplementary

$\angle 1, \angle 3$ suppl	Given
$\angle 1 \cong \angle 3, \angle 2 \cong \angle 4$	Vertical Angles Congruent
$m\angle 1 = 90, m\angle 3 = 90$	Suppl to same angle
$m\angle 1 + m\angle 2 = 180$	Angles form straight line
$90 + m\angle 2 = 180$	Substitution
$m\angle 2 = 90$	Subtraction Property
$m\angle 4 = 90$	Def of Congruence
$m\angle 2 + m\angle 4 = 180$	Addition Property
$\angle 2, \angle 4$ suppl	Def of Supplementary

- 7) Given:  $AD \parallel BE, AD \parallel CF$   
 Prove:  $BE \parallel CF$

- 8) Given:  $BE \parallel CF, m\angle 3 - m\angle 5 = 10$   
 Prove:  $m\angle 2 - m\angle 6 = 10$

AD // BE, AD // CF	Given
$\angle 1, \angle 3$ Suppl, $\angle 1, \angle 2$ Suppl	Same-side Interior
$\angle 2 \cong \angle 3$	Suppl to same angle
BE // CF	Converse of Corresponding

BE // CF $m\angle 3 - m\angle 5 = 10$	Given
$\angle 2 \cong \angle 3, \angle 5 \cong \angle 6$	Corresponding angles
$m\angle 2 = m\angle 3,$ $m\angle 5 = m\angle 6$	Def of Congruence
$m\angle 2 - m\angle 6 = 10$	Substitution