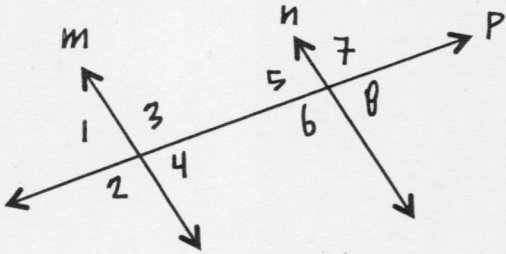


GEOMETRY: TRANSVERSAL PROOFS (CHAPTER 3.3)

ALTERNATE INTERIOR ANGLES THEOREM

Given: Line m is parallel to line n ;
Line p is a transversal

Prove: $\angle 3 \cong \angle 6$

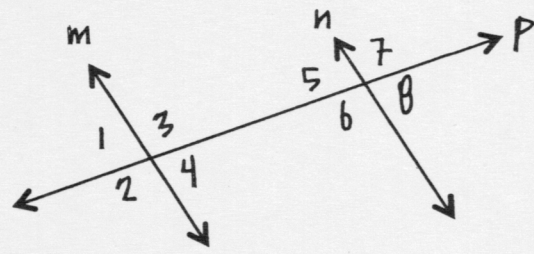


Statement	Reason
Line $m \parallel$ line n ; Line p is a transversal	Given
$\angle 3 \cong \angle 2$	Vertical angles are
$\angle 2 \cong \angle 6$	Transversal with \parallel lines means corresponding angles are
$\angle 3 \cong \angle 6$	Transitive/Substitution Property

ALTERNATE EXTERIOR ANGLES THEOREM

Given: Line m is parallel to line n ;
Line p is a transversal

Prove: $\angle 1 \cong \angle 8$

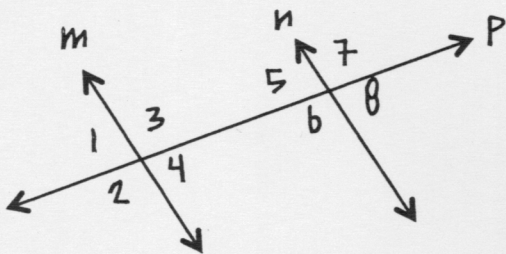


Statement	Reason
Line $m \parallel$ line n ; Line p is a transversal	Given
$\angle 1 \cong \angle 5$	Transversal with \parallel lines means corresponding angles are
$\angle 5 \cong \angle 8$	Vertical angles are
$\angle 1 \cong \angle 8$	Transitive/Substitution Property

SAME-SIDE INTERIOR ANGLES THEOREM

Given: Line m is parallel to line n ;
Line p is a transversal

Prove: $m\angle 3 + m\angle 5 = 180^\circ$

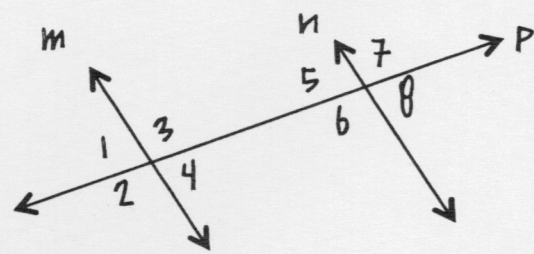


Statement	Reason
Line $m \parallel$ line n ; Line p is a transversal	Given
$m\angle 3 + m\angle 1 = 180^\circ$	Two angles forming a linear pair are supplementary
$\angle 1 \cong \angle 5$	Transversal with \parallel lines means corresponding angles are
$m\angle 1 = m\angle 5$	Two angles have equal measures
$m\angle 3 + m\angle 5 = 180^\circ$	Substitution Property (from steps 2 and 4)

SAME-SIDE EXTERIOR ANGLES THEOREM

Given: Line m is parallel to line n ;
Line p is a transversal

Prove: $m\angle 2 + m\angle 8 = 180^\circ$



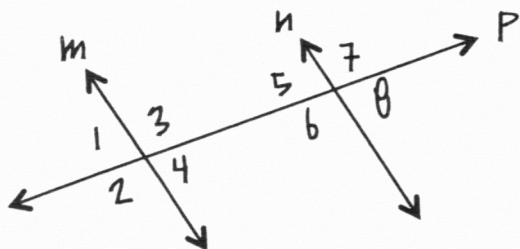
Statement	Reason
Line $m \parallel$ line n ; Line p is a transversal	Given
$m\angle 2 + m\angle 4 = 180^\circ$	Two angles forming a linear pair are supplementary
$\angle 4 \cong \angle 8$	Transversal with \parallel lines means corresponding angles are
$m\angle 4 = m\angle 8$	Two angles have equal measures
$m\angle 2 + m\angle 8 = 180^\circ$	Substitution Property (from steps 2 and 4)

GEOMETRY: CONVERSES OF TRANSVERSAL PROOFS (CHAPTER 3.4)

CONVERSE OF ALTERNATE INTERIOR ANGLES THEOREM

Given: $\angle 3 \cong \angle 6$

Prove: Line m is parallel to line n

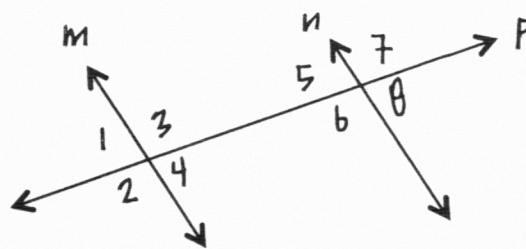


Statement	Reason
$\angle 3 \cong \angle 6$	Given
$\angle 3 \cong \angle 2$	Vertical angles are congruent
$\angle 2 \cong \angle 6$	Substitution Property (from steps 1 and 2)
Line $m \parallel$ line n	Transversal with corresponding angles means \parallel lines

CONVERSE OF ALTERNATE EXTERIOR ANGLES THEOREM

Given: $\angle 1 \cong \angle 8$

Prove: Line m is parallel to line n

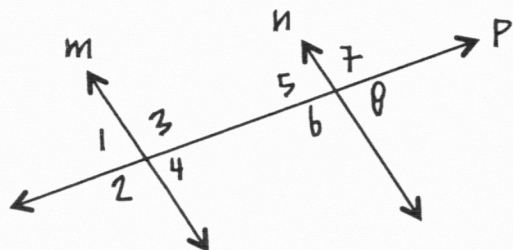


Statement	Reason
$\angle 1 \cong \angle 8$	Given
$\angle 1 \cong \angle 4$	Vertical angles are congruent
$\angle 4 \cong \angle 8$	Substitution Property (from steps 1 and 2)
Line $m \parallel$ line n	Transversal with corresponding angles means \parallel lines

CONVERSE OF SAME-SIDE INTERIOR ANGLES THEOREM

Given: $\angle 3$ and $\angle 5$ are supplementary

Prove: Line m is parallel to line n

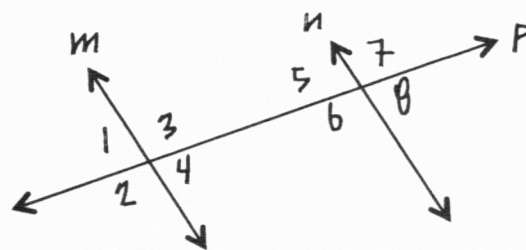


Statement	Reason
$\angle 3$ and $\angle 5$ are supplementary	Given
$m\angle 3 + m\angle 5 = 180^\circ$	Definition of Supplementary Angles
$m\angle 3 + m\angle 1 = 180^\circ$	Two angles forming a linear pair are supplementary
$m\angle 3 + m\angle 5 = m\angle 3 + m\angle 1$	Substitution Property (from steps 2 and 3)
$m\angle 5 = m\angle 1$	Subtraction Property
$\angle 5 \cong \angle 1$	Two angles with equal measures are congruent
Line $m \parallel$ line n	Transversal with corresponding angles means \parallel lines

CONVERSE OF SAME-SIDE EXTERIOR ANGLES THEOREM

Given: $\angle 2$ and $\angle 8$ are supplementary

Prove: Line m is parallel to line n



Statement	Reason
$\angle 2$ and $\angle 8$ are supplementary	Given
$m\angle 2 + m\angle 8 = 180^\circ$	Definition of Supplementary Angles
$m\angle 2 + m\angle 4 = 180^\circ$	Two angles forming a linear pair are supplementary
$m\angle 2 + m\angle 8 = m\angle 2 + m\angle 4$	Substitution Property (from steps 2 and 3)
$m\angle 8 = m\angle 4$	Subtraction Property
$\angle 8 \cong \angle 4$	Two angles with equal measures are congruent
Line $m \parallel$ line n	Transversal with corresponding angles means \parallel lines