6.3

Proving Quadrilaterals are Parallelograms

Opposite Sides Theorem

If a quadrilateral is a parallelogram, then the opposite sides are congruent.

Opposite Angles Theorem

If a quadrilateral is a parallelogram, then the opposite angles are congruent.

Consecutive Angles Theorem

If a quadrilateral is a parallelogram, then the consecutive angles are supplementary.

Parallelogram Diagonals Theorem

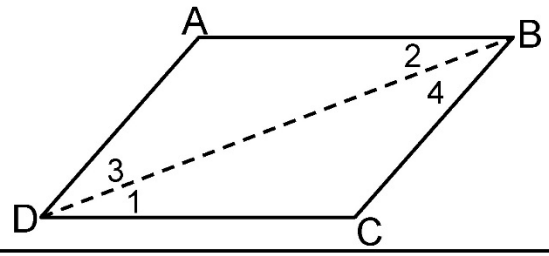
If a quadrilateral is a parallelogram, then the diagonals bisect each other.

What do you need to prove a quadrilateral is a parallelogram?

- _____
- _____
- _____
- _____
- _____
- _____

Given: $\overline{AB} \parallel \overline{CD}$, $\overline{AB} \cong \overline{CD}$

Prove: Prove *ABCD* is a parallelogram



Statement	Reasons

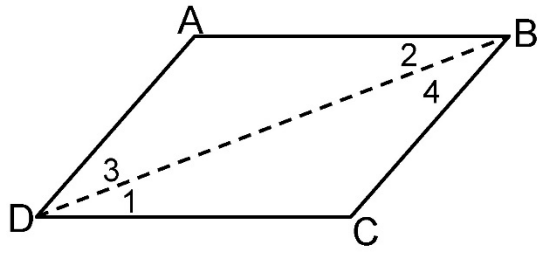
Same Side Parallel & Congruent Theorem

POK

If a quadrilateral has a pair of opposite sides both _____ & _____, then it is a parallelogram.

Given: $\overline{AB} \cong \overline{CD}$ and $\overline{AD} \cong \overline{CB}$

Prove: Prove $ABCD$ is a parallelogram



Statement	Reasons

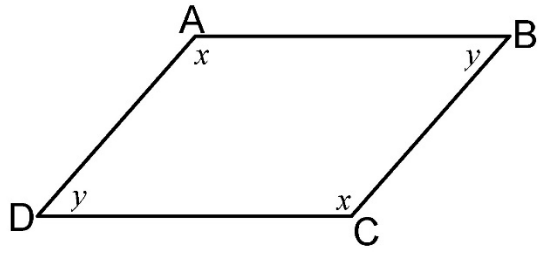
Converse of the Opposite Sides Theorem

If a quadrilateral has _____ sides _____, then it is a parallelogram.

POK

Given: $\angle A$ & $\angle D$ and $\angle A$ & $\angle B$ are supplementary

Prove: Prove $ABCD$ is a parallelogram



Statement	Reasons
1) $\angle A$ & $\angle D$ and $\angle A$ & $\angle B$ are supplementary	
2) $\overline{AB} \parallel \overline{CD}$, $\overline{AD} \parallel \overline{BC}$	
3) Prove $ABCD$ is a parallelogram	

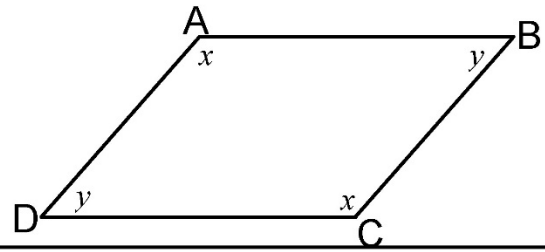
POK

Converse of the Consecutive Angles Theorem

If a quadrilateral has _____ consecutive angles, then it is a parallelogram.

Given: $\angle A \cong \angle C$ and $\angle B \cong \angle D$

Prove: Prove $ABCD$ is a parallelogram



Statement	Reasons
1) $\angle A \cong \angle C$ and $\angle B \cong \angle D$	
2) $x+y+x+y=360$	
3) $2(x+y)=360$	
4) $2(x+y)=360$	
5) $x+y=180$	
6) $\angle A$ & $\angle D$ and $\angle A$ & $\angle B$ are supplementary	
7)	
8)	

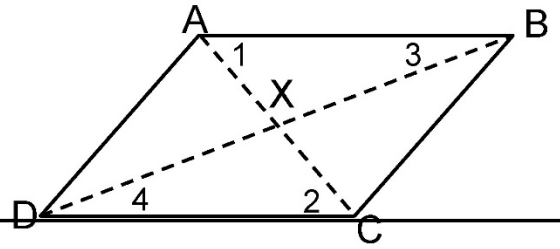
Converse of the Opposite Angles Theorem

If a quadrilateral has opposite _____ _____, then it is a parallelogram.

POK

Given: $\overline{AX} \cong \overline{CX}$ and $\overline{BX} \cong \overline{DX}$

Prove: Prove *ABCD* is a parallelogram



Statement	Reasons
1) Parallelogram ABCD with diagonal $\overline{BD}$	

POK

Converse of the Parallelogram Diagonals Theorem

If a quadrilateral's _____ _____each other, then it is a parallelogram.