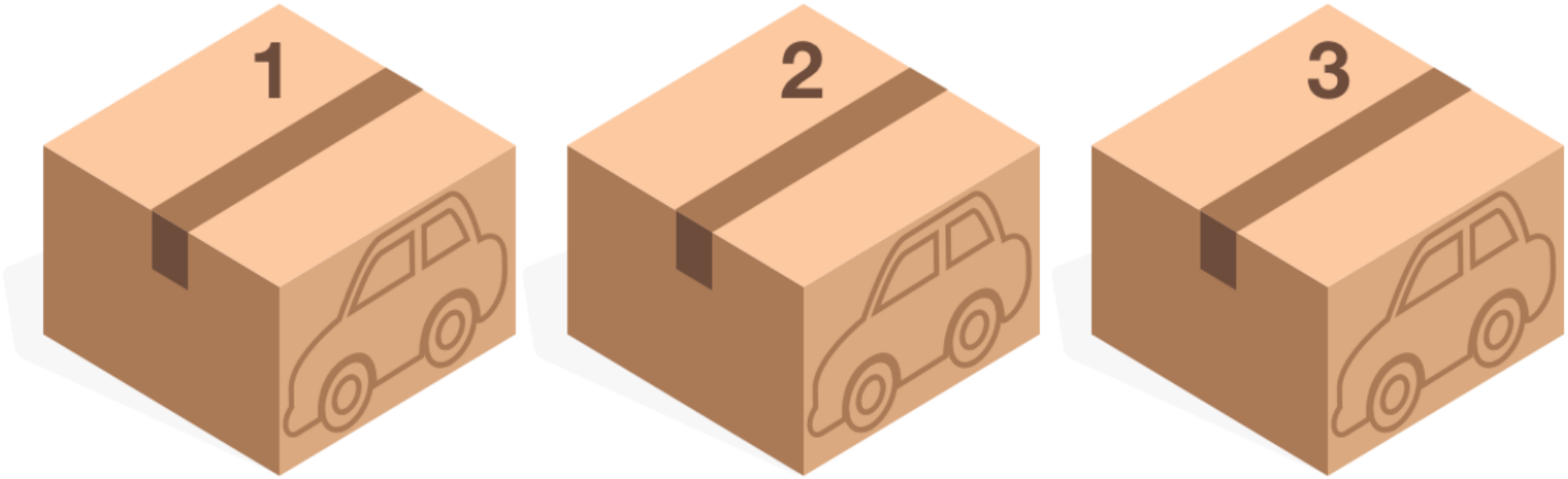
Warm Up

9/13/22

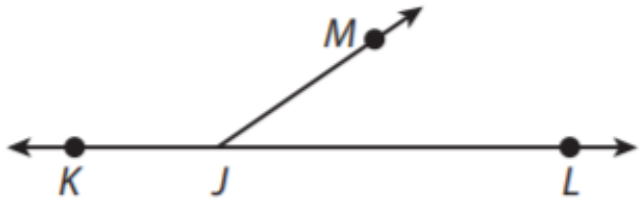


One of the boxes contains a car.

On each box there is a statement, exactly one of which is true.

Where is the car? Justify your reasoning.

Justify Reasoning Prove the Linear Pair Theorem.
Given: $\angle MJK$ and $\angle MJL$ are a linear pair of angles.
Prove: $\angle MJK$ and $\angle MJL$ are supplementary.



Complete the proof by writing the missing reasons.
Choose from the following reasons.

Angle Addition Postulate

Definition of linear pair

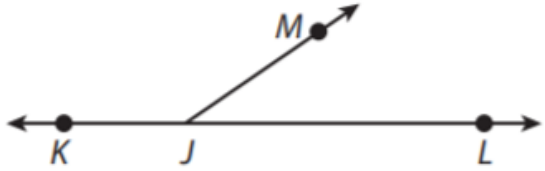
Substitution Property of Equality

Given

Statements	Reasons
1. $\angle MJK$ and $\angle MJL$ are a linear pair.	**1.**
2. $\overrightarrow{JL}$ and $\overrightarrow{JK}$ are opposite rays.	**2.**
3. $\overrightarrow{JL}$ and $\overrightarrow{JK}$ form a straight line.	**3.** Definition of opposite rays
4. $m\angle LJK = 180°$	**4.** Definition of straight angle
5. $m\angle MJK + m\angle MJL = m\angle LJK$	**5.**
6. $m\angle MJK + m\angle MJL = 180°$	**6.**
7. $\angle MJK$ and $\angle MJL$ are supplementary.	**7.** Definition of supplementary angles

Proof of Linear Pair Theorem.

Given: $\angle MJK$ and $\angle MJL$ are a linear pair of angles.
Prove: $\angle MJK$ and $\angle MJL$ are supplementary.



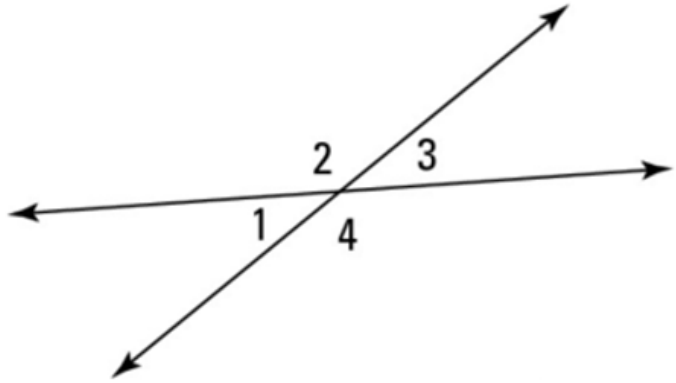
Statements	Reasons
1. $\angle MJK$ and $\angle MJL$ are a linear pair.	1. Given
2. $\overrightarrow{JL}$ and $\overrightarrow{JK}$ are opposite rays.	2. Definition of Linear Pair
3. $\overrightarrow{JL}$ and $\overrightarrow{JK}$ form a straight line.	3. Definition of Opposite Rays
4. $m\angle LJK = 180°$	4. Definition of Straight Angles
5. $m\angle MJK + m\angle MJL = m\angle LJK$	5. Angle Addition Postulate
6. $m\angle MJK + m\angle MJL = 180°$	6. Substitution Property of Equality
7. $\angle MJK$ and $\angle MJL$ are supplementary	7. Definition of Supplementary Angles

Proof of Vertical Angles Theorem

Vertical Angles Theorem

Given: $\angle 1$ and $\angle 3$ are vertical angles.

Prove: $\angle 1 \cong \angle 3$

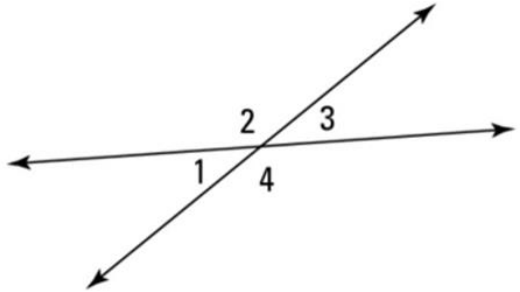


Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.

Proof of Vertical Angles Theorem.

Given: $\angle 1$ and $\angle 3$ are vertical angles.

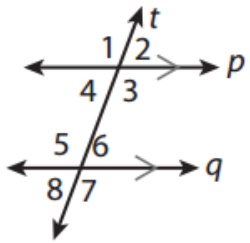
Prove: $\angle 1 \cong \angle 3$



Statements	Reasons
1. $\angle 1$ and $\angle 3$ are vertical	1. Given
2. $\angle 1$ and $\angle 2$ are a linear pair $\angle 2$ and $\angle 3$ are a linear pair	2. Given (from diagram)
3. $\angle 1$ and $\angle 2$ are supplementary $\angle 2$ and $\angle 3$ are supplementary	3. Linear Pair Theorem
4. $m\angle 1$ +m $\angle 2 = 180$ $m\angle 2$ +m $\angle 3 = 180$	4. Definition of Supplementary
5. $m\angle 1$ +m $\angle 2 = m\angle 2$ +m $\angle 3$	5. Transitive Property of Equality
6. $m\angle 1 = m\angle 3$	6. Subtraction Property of Eq.
7. $\angle 1 \cong \angle 3$	7. Definition of Congruence

Given: $p \parallel q$

Prove: $m\angle 4 = m\angle 6$

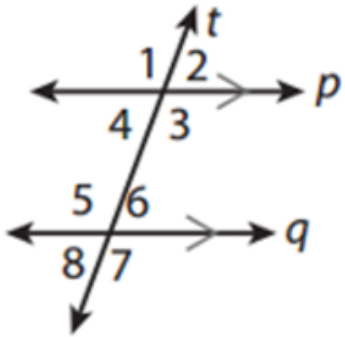


Choose from the following reasons. You may use a reason more than once.

- Same-Side Interior Angles Postulate
- Definition of Supplementary Angles
- Subtraction Property of Equality
- Substitution Property of Equality
- Given
- Linear Pair Theorem

Statements	Reasons
1. $p \parallel q$	1.
2. $\angle 4$ and $\angle 5$ are supplementary	2.
3. $m\angle 4 + m\angle 5 = 180°$	3.
4. $\angle 5$ and $\angle 6$ are a linear pair	4.
5. $\angle 5$ and $\angle 6$ are supplementary	5.
6. $m\angle 5 + m\angle 6 = 180°$	6.
7. $m\angle 4 + m\angle 5 = m\angle 5 + m\angle 6$	7.
8. $m\angle 4 = m\angle 6$	8.

Proof of Interior Angles Theorem



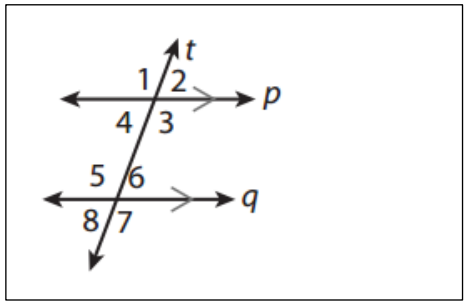
Given: $p \parallel q$

Prove: $m\angle 4 = m\angle 6$

Statements	Reasons
1. $p \parallel q$	1. Given
2. $\angle 4$ & $\angle 5$ are supplementary	2. Same-Side Interior Angles Postulate
3. $m\angle 4 + m\angle 5 = 180°$	3. Definition of Supplementary Angles
4. $\angle 5$ & $\angle 6$ are a linear pair	4. Given
5. $\angle 5$ & $\angle 6$ are supplementary	5. Linear Pair Theorem
6. $m\angle 5 + m\angle 6 = 180°$	6. Definition of Supplementary Angles
7. $m\angle 4 + m\angle 5 = m\angle 5 + m\angle 6$	7. Substitution Property of Equality
8. $m\angle 4 = m\angle 6$	8. Subtraction Property of Equality

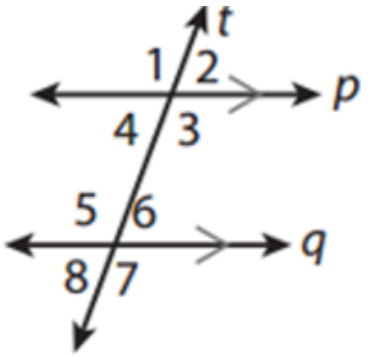
Prove the Alternate Exterior Angles Theorem

Given: $p \parallel q$
Prove: $\angle 1 \cong \angle 7$



Statements	Reasons
1. $p \parallel q$	1.
2.	2.
3.	3.
4.	4.
5.	5.

Proof of Exterior Angles Theorem



Given: $p \parallel q$

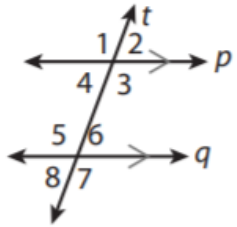
Prove: $m\angle 1 = m\angle 7$

Statements	Reasons
1. $p \parallel q$	1. given
2. $m\angle 1 = m\angle 3$	2. Vertical Angles Theorem
3. $m\angle 3 = m\angle 5$	3. Alternate Interior Angles Theorem
4. $m\angle 5 = m\angle 7$	4. Vertical Angles Theorem
5. $m\angle 1 = m\angle 7$	5. Transitive Property of Equality

Write a proof in two-column form for the Corresponding Angles Theorem.

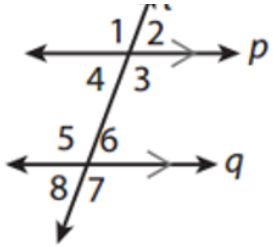
Given: $p \parallel q$

Prove: $m\angle 1 = m\angle 5$



Statements	Reasons

Proof of Corresponding Angles Theorem



Given: $p \parallel q$

Prove: $m\angle 1 = m\angle 5$

Statements	Reasons
1. $p \parallel q$	1. given
2. $m\angle 1 = m\angle 3$	2. Vertical Angles Theorem
3. $m\angle 3 = m\angle 5$	3. Alternate Interior Angles Theorem
4. $m\angle 1 = m\angle 5$	4. Substitution Property of Equality