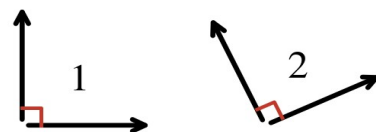


Theorems are statements we can prove — today we prove four of them.

Right Angles Congruence Theorem

All right angles are _____.



Congruent Supplements & Complements Theorems

If two angles are supplementary to the same angle (or to congruent angles), then they are _____.

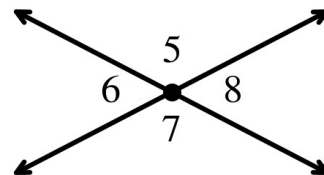
If two angles are complementary to the same angle (or to congruent angles), then they are _____.



Linear Pair Postulate & Vertical Angles Theorem

If two angles form a linear pair, then they are _____.

Vertical angles are _____.



Example 1 - Prove the Right Angles Congruence Theorem

Given: $\angle 1$ and $\angle 2$ are right angles. Prove: $\angle 1 \cong \angle 2$.

Statements	Reasons
1. $\angle 1$ and $\angle 2$ are right angles	1. Given
2.	2.
3.	3.
4.	4.

Example 2 - Perpendicular Segments

Given: Segment $PQ \perp$ segment QR , and segment $SR \perp$ segment QR .
Prove: $\angle Q \cong \angle R$.

Statements	Reasons
1. $PQ \perp QR$; $SR \perp QR$	1. Given
2.	2.
3.	3.



Example 3 - Prove the Congruent Supplements Theorem

Given: $\angle 1$ and $\angle 2$ are supplementary; $\angle 2$ and $\angle 3$ are supplementary.
Prove: $\angle 1 \cong \angle 3$.

Statements	Reasons
1.	1. Given
2. $m\angle 1 + m\angle 2 = 180^\circ$; $m\angle 2 + m\angle 3 = 180^\circ$	2.
3.	3. Substitution
4. $m\angle 2 = m\angle 2$	4. Reflexive Property of Equality
5. $m\angle 1 = m\angle 3$	5.
6.	6. Definition of congruent angles

Example 4 - Prove the Vertical Angles Theorem

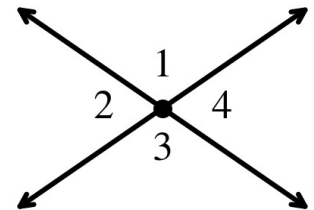
Given: $\angle 5$ and $\angle 7$ are vertical angles. Prove: $\angle 5 \cong \angle 7$.

Statements	Reasons
1. $\angle 5$ and $\angle 7$ are vertical angles	1. Given
2.	2.
3.	3.
4.	4.

Example 5 - Geometry and Algebra

Use the diagrams at the right.

- a) In the top diagram, $m\angle 1 = 123^\circ$. Find $m\angle 2$, $m\angle 3$, and $m\angle 4$.



- b) In the bottom diagram, find the value of w .

