

Prove Angle Pair Relationships Practice Sheet

1) Prove the Vertical Angles Congruence Theorem.

Given: $\angle 5$ and $\angle 7$ are vertical anglesProve: $\angle 5 \cong \angle 7$ 

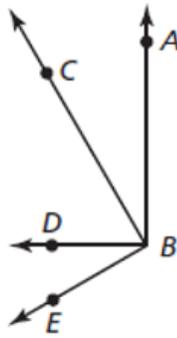
STATEMENTS	REASONS
1) $\angle 5$ and $\angle 7$ are vertical angles	1) Given
2) $\angle 5$ and $\angle 6$ are a linear pair $\angle 6$ and $\angle 7$ are a linear pair	2) Def. of linear pair
3) $\angle 5$ and $\angle 6$ are supplementary $\angle 6$ and $\angle 7$ are supplementary	3) Linear Pair Postulate
4) $\angle 5 \cong \angle 7$	4) Congruent Supplements Thm

2) Given: $AB = DE$, $BC = CD$ Prove: $\overline{AC} \cong \overline{CE}$ 

STATEMENTS	REASONS
1) $AB = DE$, $BC = CD$	1) Given
2) $AC = AB + BC$	2) Segment Addition Postulate
3) $CD + DE = CE$	3) Segment Addition Postulate
4) $AC = DE + CD$	4) Substitution PoE
5) $AC = CE$	5) Transitive PoE
6) $\overline{AC} \cong \overline{CE}$	6) Def. of congruence

- 3) Given $\angle ABD$ is a right angle.
 $\angle CBE$ is a right angle.

Prove $\angle ABC \cong \angle DBE$



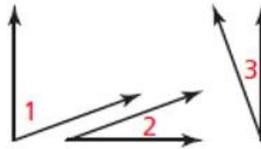
STATEMENTS

REASONS

1. $\angle ABD$ is a right angle. $\angle CBE$ is a right angle.	1. <u>Given</u>
2. $\angle ABC$ and $\angle CBD$ are complementary.	2. Definition of complementary angles
3. $\angle DBE$ and $\angle CBD$ are complementary.	3. <u>Def. of complementary angles</u>
4. $\angle ABC \cong \angle DBE$	4. <u>Congruent Complements Thm</u>

- 4) Given $\angle 1$ and $\angle 2$ are complementary.
 $\angle 1$ and $\angle 3$ are complementary.

Prove $\angle 2 \cong \angle 3$



Statements	Reasons
1) $\angle 1$ and $\angle 2$ are complementary $\angle 1$ and $\angle 3$ are complementary	1) Given
2) $m\angle 1 + m\angle 2 = 90$ $m\angle 1 + m\angle 3 = 90$	2) Def. of complementary
3) $m\angle 2 = 90 - m\angle 1, m\angle 3 = 90 - m\angle 1$	3) Subtraction PoE
4) $m\angle 2 = m\angle 3$	4) Transitive
5) $\angle 2 \cong \angle 3$	5) Def. of congruence

- 5) Given $\angle 1$ and $\angle 2$ are supplementary.
 $\angle 3$ and $\angle 4$ are supplementary.
 $\angle 1 \cong \angle 4$

Prove $\angle 2 \cong \angle 3$



STATEMENTS	REASONS
1. $\angle 1$ and $\angle 2$ are supplementary. $\angle 3$ and $\angle 4$ are supplementary. $\angle 1 \cong \angle 4$	1. Given
2. $m\angle 1 + m\angle 2 = 180^\circ$, $m\angle 3 + m\angle 4 = 180^\circ$	2. <u>Def. of supplementary</u>
3. <u>$m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$</u>	3. Transitive Property of Equality
4. $m\angle 1 = m\angle 4$	4. Definition of congruent angles
5. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	5. Substitution Property of Equality
6. $m\angle 2 = m\angle 3$	6. <u>subtraction PoE</u>
7. <u>$\angle 2 \cong \angle 3$</u>	7. <u>Def. of congruence</u>