Proving Angle Relationships and Parallel Lines: Homework

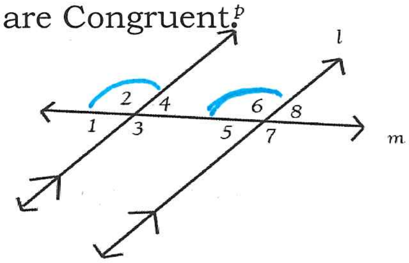
Key

Practice this

1. Use $\boxed{\text{Alternate Exterior Angles}}$ to prove **Corresponding Angles** are Congruent.

Given: $p // l$ ~~and m is a transversal of p and l~~ m

Prove: $\angle 2 \cong \angle 6$

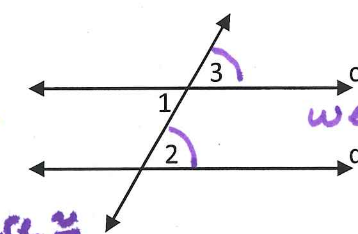


1. $p // l$	1. given
2. $\angle 6 \cong \angle 7$	2. vertical ∠s are ≅
3. $\angle 2 \cong \angle 7$	3. // lines form ≅ alt. Ext. ∠s.
4. $\angle 2 \cong \angle 6$	4. Substitution

Proof of the Alternate Interior Angles Converse Theorem:

- If alternate interior angles are ≅ then the lines are //.

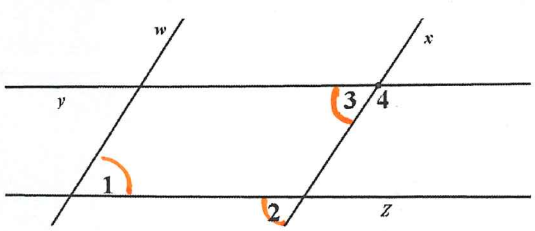
Given: $\angle 1 \cong \angle 2$
Prove: $c \parallel d$



we know ≅ corr. ∠s form // lines

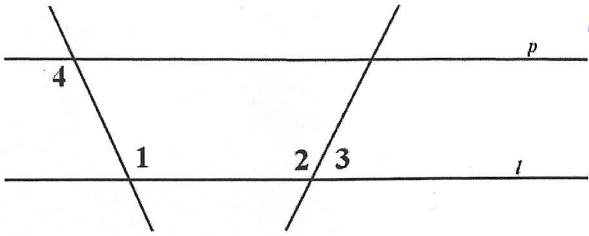
1. $\angle 1 \cong \angle 2$	1. given
2. $\angle 1 \cong \angle 3$	2. Vertical ∠s are ≅
3. $\angle 3 \cong \angle 2$	3. substitution
4. $c // d$	4. ≅ corr. ∠s form // lines

3. Given: $w // x$ and $y // z$
Prove: <1 and <4 are supplementary



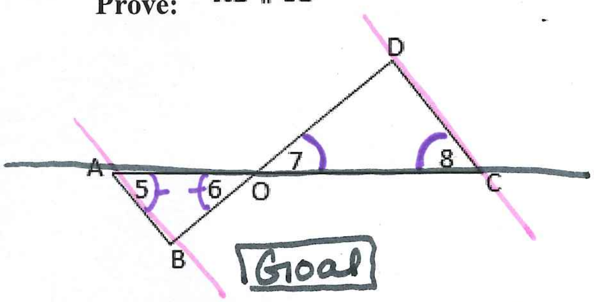
1. $w // x$ and $y // z$	1. given
2. $\angle 1 \cong \angle 2$	2. // lines form ≅ alt. int ∠s.
3. $\angle 3 \cong \angle 2$	3. // lines form ≅ corr. ∠s.
4. $\angle 3 + \angle 4 = 180$	4. linear pairs are suppl.
5. $\angle 1 \cong \angle 3$	5. subst.
6. $\angle 1 + \angle 4 = 180$	6. Subst.
7. $\angle 1$ and $\angle 4$ are suppl.	7. def of suppl.

4. Given: <1≅<2 and l // p
Prove: <3 + <4 = 180°



1. $\angle 2 \cong \angle 1$ $l \parallel p$	1. given
2. $\angle 1 \cong \angle 4$	2. $\parallel$ lines form $\cong$ alt. int $\angle$s
3. $\angle 2 + \angle 3 = 180°$	3. linear pairs are suppl.
4. $\angle 2 \cong \angle 4$	4. subs.
5. $\angle 4 + \angle 3 = 180$	5. Subs.

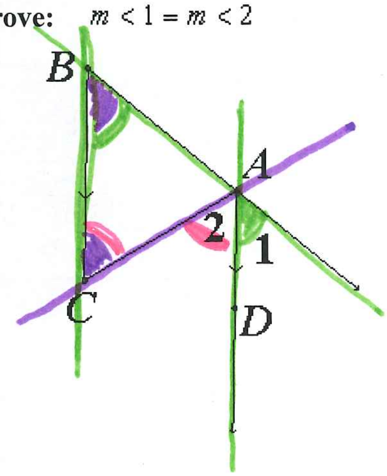
5. **Given:** $m\angle 5 = m\angle 6$ and $m\angle 7 = m\angle 8$
Prove: $\overline{AB} \parallel \overline{CD}$



want to show $\angle 5 \cong \angle 8$ and use $\cong$ alt. int $\angle$s form Parallel lines.

1. $\angle 5 \cong \angle 6$, $\angle 7 \cong \angle 8$	1. given
2. $\angle 6 \cong \angle 7$	2. vertical $\angle$s are $\cong$
3. $\angle 5 \cong \angle 8$	3. Substitution
4. $AB \parallel CD$	4. $\cong$ alt int $\angle$s form $\parallel$ lines

6. **Given:** $m < B = m < C$ and $\overline{AD} \parallel \overline{BC}$
Prove: $m < 1 = m < 2$



1. $\angle B \cong \angle C$ $AD \parallel BC$	1. given
2. $\angle B \cong \angle 1$	2. $\parallel$ lines form $\cong$ corr. $\angle$s.
3. $\angle C \cong \angle 2$	3. $\parallel$ lines form $\cong$ alt. int $\angle$s.
4. $\angle 1 \cong \angle 2$	4. Substitution