

### 2.5 – Parallel Line Converse Theorems

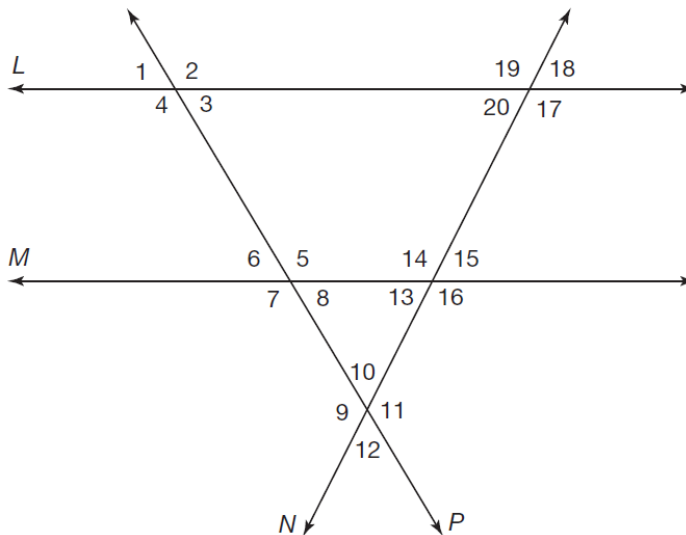
From your text, complete the problems below. Attach those pages to this sheet.

- Page 199, "Talk the Talk"
- Pages 208 - 209, "Talk the Talk"

3. Given:  $\angle 2 \cong \angle 7 \cong \angle 19$   
 $m\angle 2 = 125^\circ$

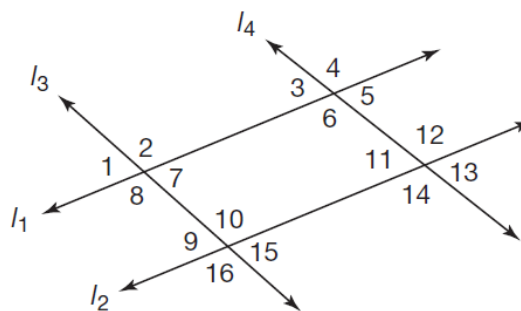
Determine the measure of each angle in the diagram.

- $m\angle 1 = \underline{\hspace{2cm}}$      $m\angle 2 = 125^\circ$   
 $m\angle 3 = \underline{\hspace{2cm}}$      $m\angle 4 = \underline{\hspace{2cm}}$   
 $m\angle 5 = \underline{\hspace{2cm}}$      $m\angle 6 = \underline{\hspace{2cm}}$   
 $m\angle 7 = \underline{\hspace{2cm}}$      $m\angle 8 = \underline{\hspace{2cm}}$   
 $m\angle 9 = \underline{\hspace{2cm}}$      $m\angle 10 = \underline{\hspace{2cm}}$   
 $m\angle 11 = \underline{\hspace{2cm}}$      $m\angle 12 = \underline{\hspace{2cm}}$   
 $m\angle 13 = \underline{\hspace{2cm}}$      $m\angle 14 = \underline{\hspace{2cm}}$   
 $m\angle 15 = \underline{\hspace{2cm}}$      $m\angle 16 = \underline{\hspace{2cm}}$   
 $m\angle 17 = \underline{\hspace{2cm}}$      $m\angle 18 = \underline{\hspace{2cm}}$   
 $m\angle 19 = \underline{\hspace{2cm}}$      $m\angle 20 = \underline{\hspace{2cm}}$



4. Given:  $\ell_1 \parallel \ell_2$   
 $\ell_3 \parallel \ell_4$

Using the diagram, provide the appropriate theorem or postulate that supports each statement.



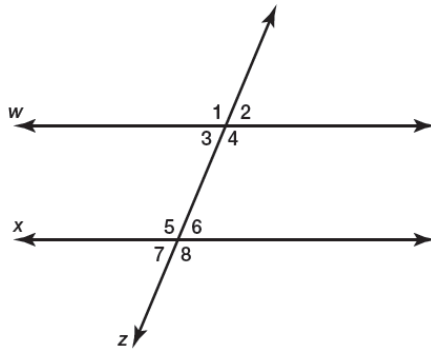
Statement	Theorem or Postulate
1. $\angle 3 \cong \angle 13$	
2. $\angle 9 \cong \angle 11$	
3. $\angle 10 \cong \angle 14$	
4. $\angle 9$ and $\angle 10$ are supplementary angles.	
5. $\angle 6$ and $\angle 11$ are supplementary angles.	
6. $\angle 12 \cong \angle 14$	

### Two-Column Proof Problems:

5. Use the Corresponding Angles Postulate to prove the Same-Side Interior Angles Theorem.

Given:  $w \parallel x$

Prove:  $\angle 3$  &  $\angle 5$  are supplementary angles



Use this diagram for all proofs.

6. Use the Converse of the Corresponding Angles Postulate to prove the Converse of the Alternate Interior Angles Theorem.

Given:  $\angle 3 \cong \angle 6$

Prove:  $w \parallel x$

7. Use the Converse of the Corresponding Angles Postulate to prove the Converse of the Alternate Exterior Angles Theorem: "If two lines and a transversal form alternate exterior angles that are congruent, then the two lines are parallel."

Given:  $\angle 1 \cong \angle 8$

Prove:  $w \parallel x$

8. Use the Converse of the Corresponding Angles Postulate to prove the Converse of the Same-Side Interior Angles Theorem.

Given:  $\angle 3$  &  $\angle 5$  are supplementary

Prove:  $w \parallel x$

9. Use the Converse of the Corresponding Angles Postulate to prove the Converse of the Same-Side Exterior Angles Theorem: "If two lines and a transversal form same-side exterior angles that are supplementary, then the two lines are parallel."

Given:  $\angle 2$  &  $\angle 8$  are supplementary

Prove:  $w \parallel x$

**Proofs must be done on proof paper.**