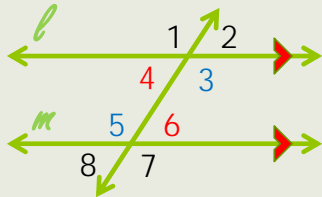


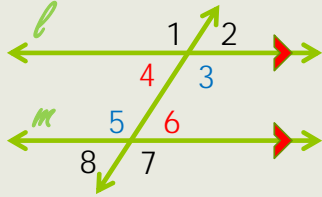
Section 3-2 Properties of Parallel Lines – Day 1, Calculations.

Michael Schuetz

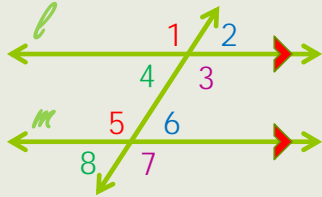
Postulate 3-1: Same-Side Interior Angles Postulate.

Postulate		
If a transversal intersects two parallel lines, then same-side interior angles are supplementary	If $l \parallel m$	
	Then	$m\angle 4 + m\angle 5 = 180$ $m\angle 3 + m\angle 6 = 180$

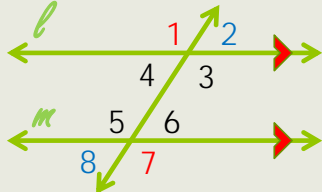
Theorem 3-1: Alternate Interior Angles Theorem. (AIA)

Theorem	If $l \parallel m$	
If a transversal intersects two parallel lines, then alternate interior angles are congruent.	Then	$\angle 4 \cong \angle 6$ $\angle 3 \cong \angle 5$

Theorem 3-2: Corresponding Angles Theorem. (Corr \angle 's)

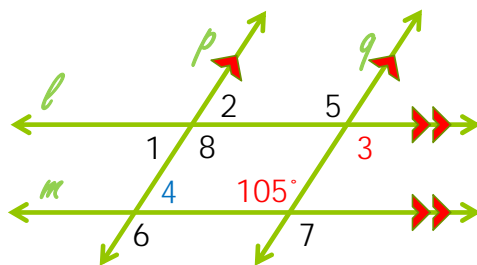
Theorem	If $l \parallel m$	
If a transversal intersects two parallel lines, then corresponding angles are congruent.	Then	$\angle 1 \cong \angle 5 \quad \angle 3 \cong \angle 7$ $\angle 2 \cong \angle 6 \quad \angle 4 \cong \angle 8$

Theorem 3-3: Alternate Exterior Angles Theorem. (AEA)

Theorem	If $l \parallel m$	
If a transversal intersects two parallel lines, then Alternate exterior angles are congruent.	Then	$\angle 1 \cong \angle 7$ $\angle 2 \cong \angle 8$

Example 1, Angle Measure

- What are the measures of angles 3 and 4? Which theorem or postulate justifies your answer?

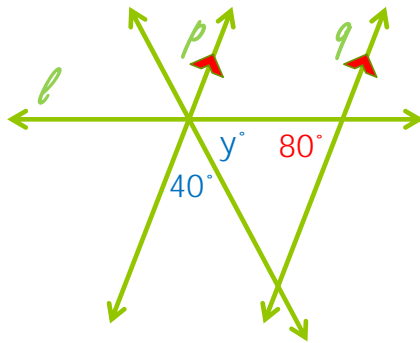


$m\angle 3 = 105^\circ$
 AIA Theorem

$m\angle 4 = 75^\circ$
 Same-Side Interior Postulate

Example 2, Angle Measure

- What is the value of y ? Which theorem or postulate justifies your answer?



Same-Side
Interior Postulate
tells us that

$$(40^\circ + y^\circ) + 80^\circ = 180^\circ$$

$$(40^\circ + y^\circ) = 100^\circ$$

$$y^\circ = 60^\circ$$

Homework: Day 1

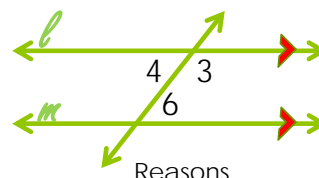
- P. 153, #'s 7-9, 12-20, 22, 27-36

Section 3-2 Properties of Parallel Lines – Day 2, Proofs.

Michael Schuetz

Proof of Theorem 3-1: AIA

- Given: $l // m$
- Prove: $\angle 4 \cong \angle 6$



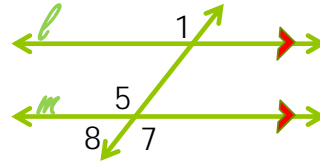
Statements

Reasons

- | | |
|--|--|
| 1. $l // m$ | 1. Given |
| 2. $m\angle 3 + m\angle 4 = 180^\circ$ | 2. Supplementary Angles |
| 3. $m\angle 3 + m\angle 6 = 180^\circ$ | 3. Same-Side Interior Angles Postulate |
| 4. $m\angle 3 + m\angle 4 = m\angle 3 + m\angle 6$ | 4. Transitive Property of Equality |
| 5. $m\angle 4 = m\angle 6$ | 5. Subtraction Property of Equality |
| 6. $\angle 4 \cong \angle 6$ | 6. Definition of Congruence |

Proving an angle relationship

- Given: $l // m$
- Prove: $\angle 1$ and $\angle 8$ are supplementary



Statements

Reasons

- | | |
|---|--|
| 1. $l // m$ | 1. Given |
| 2. $\angle 1 \cong \angle 5$ | 2. If lines are $//$, then Corr \angle 's are \cong |
| 3. $m\angle 1 = m\angle 5$ | 3. $\cong \angle$'s have equal measure. |
| 4. $\angle 5$ and $\angle 8$ are Suppl. | 4. \angle 's that form a linear pair are suppl. |
| 5. $m\angle 5 + m\angle 8 = 180$ | 5. Def. of suppl. \angle 's |
| 6. $m\angle 1 + m\angle 8 = 180$ | 6. Substitution Property |
| 7. $\angle 1$ and $\angle 8$ are Suppl. | 7. Def. of suppl. \angle 's |

Homework: Day 2

- P. 153, #'s 10, 11, 25, 26, 37-39.