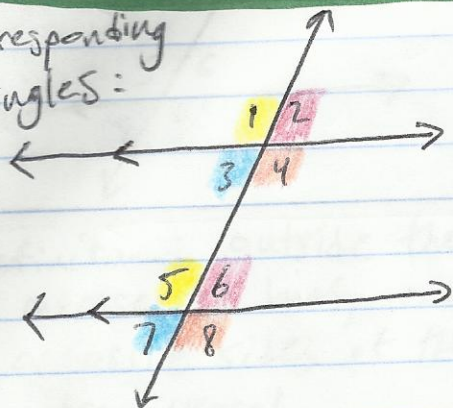


3-1: Properties of Parallel Lines

Coplanar

Transversal: a line that intersects two lines at two distinct points.

Corresponding Angles:



Corresponding Angles Postulate:

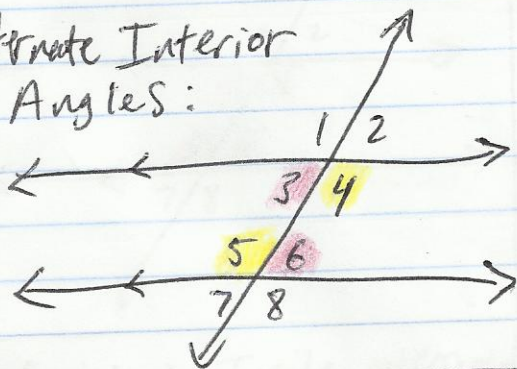
If 2 \parallel lines are intersected by a transversal, then corresponding angles are congruent.

Definition: on same side of the transversal, in matching positions on the two intersected lines.

Examples:

$$\begin{aligned}\angle 1 &\cong \angle 5 \\ \angle 3 &\cong \angle 7 \\ \angle 2 &\cong \angle 6 \\ \angle 4 &\cong \angle 8\end{aligned}$$

Alternate Interior Angles:



Alternate Interior \angle s Theorem:

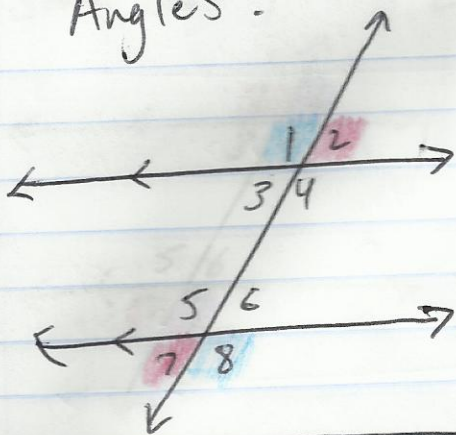
If 2 \parallel lines are intersected by a transversal, then alternate interior angles are \cong .

Definition: Inside the two intersected lines, on opposite sides of the transversal.

Examples:

$$\begin{aligned}\angle 3 &\cong \angle 6 \\ \angle 4 &\cong \angle 5\end{aligned}$$

Alternate Exterior Angles:



Definition: outside the intersected lines, on opposite sides of the transversal.

Alternate Exterior \angle s Theorem:

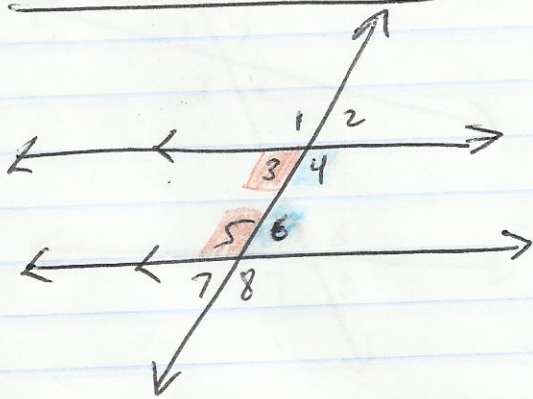
If 2 \parallel lines are intersected by a transversal, then alternate exterior angles are \cong .

Examples:

$$\angle 2 \cong \angle 7$$

$$\angle 1 \cong \angle 8$$

Same-Side Interior \angle s:



Definition: Inside intersected lines, on same side of the transversal.

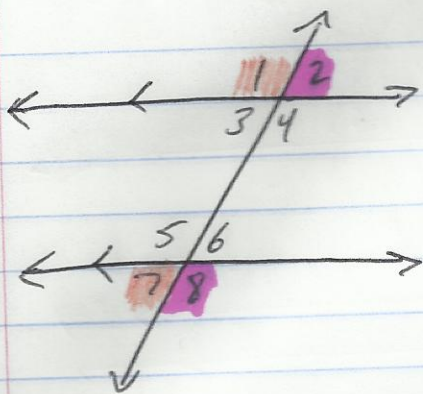
Same-Side Interior \angle s Theorem

If 2 \parallel lines are intersected by a transversal, then same side interior \angle s are supplementary.

Ex)

$$\begin{array}{l} \angle 3 \text{ and } \angle 5 \\ \angle 4 \text{ and } \angle 6 \end{array} \rightarrow \text{Supplementary}$$

Same-Side Exterior \angle s



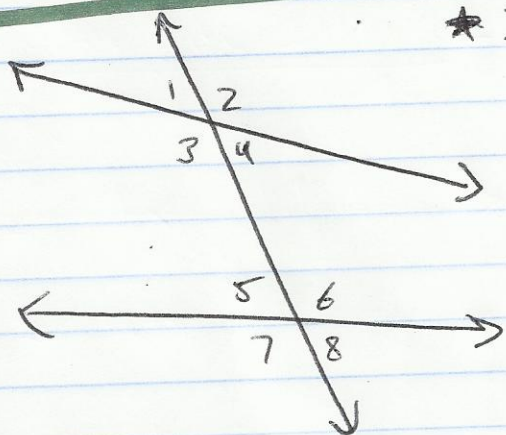
Same-Side Exterior \angle s Theorem:

If 2 \parallel lines are intersected by a transversal, then same-side exterior \angle s are supplementary.

Definition: outside the intersected lines, on the same side of the transversal.

Examples:

$\angle 1$ and $\angle 7$
 $\angle 2$ and $\angle 8$ } Supplementary



★ IMPORTANT ★

Even if the lines being intersected are NOT \parallel , the angles are still named the same.

For example: $\angle 1$ and $\angle 5$ would still be "corresponding \angle s", but they would NOT be \cong , because the lines aren't \parallel .

★ memory trick (Think: "same-side supplementary.")

Homework: pg. 131 + 132: 1-30 (omit 26-27)