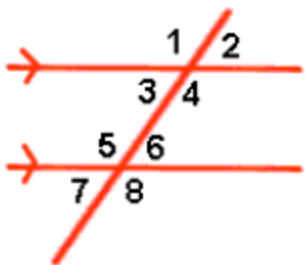


**Parallels: If lines are parallel ...**



**Corresponding angles** are equal.

$$m\angle 1 = m\angle 5, m\angle 2 = m\angle 6, m\angle 3 = m\angle 7, m\angle 4 = m\angle 8$$

**Alternate Interior angles** are equal.

$$m\angle 3 = m\angle 6, m\angle 4 = m\angle 5$$

**Alternate Exterior angles** are equal.

$$m\angle 1 = m\angle 8, m\angle 2 = m\angle 7$$

**Same side interior angles** are supp.

$$m\angle 3 + m\angle 5 = 180, m\angle 4 + m\angle 6 = 180$$

**Angle relationships due to parallel lines**

**Definition of alternate interior angles**

- says that “If two angles are alternate interior, then they are on opposite sides of a transversal and are both on the interior to two lines (whether parallel or not).”

**Alternate interior angle theorem**

- says that “If two lines are parallel and alternate interior angles are formed, then the angles will be congruent to one another.”

**Converse of alternate interior angle theorem**

- says that “If alternate interior angles are congruent, then the lines that form them will be parallel to one another.”

**Definition of alternate exterior angles**

– says that

“If two angles are alternate exterior, then they are on opposite sides of a transversal and are both on the exterior to two lines (whether parallel or not).”

**Alternate exterior angle theorem**

– says that

“If two lines are parallel and alternate exterior angles are formed, then the angles will be congruent to one another.”

**Converse of alternate exterior angle theorem**

– says that

“If alternate exterior angles are congruent, then the lines that form them will be parallel to one another.”

**Definition of corresponding angles**

– says that

“If two angles are corresponding, then they are on same side of a transversal and are both on corresponding sides (one interior/one exterior) to two lines (whether parallel or not).”

**Corresponding Angle Postulate**

– says that

“If two lines are parallel and corresponding angles are formed, then the angles will be congruent to one another.”

**Converse of corresponding angle postulate**

– says that

“If corresponding angles are congruent, then the lines that form them will be parallel to one another.”

### **Definition of same side interior angles**

– says that

“If two angles are same side interior, then they are on the same side of a transversal and are both on the interior to two lines (whether parallel or not).”

### **Same side interior angle theorem**

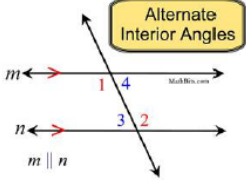
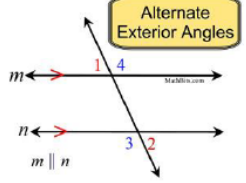
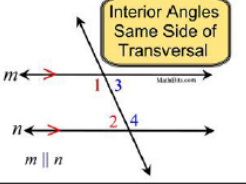
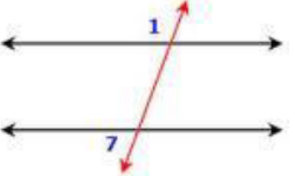
– says that

“If two lines are parallel and same side interior angles are formed, then the angles will be supplementary to one another.”

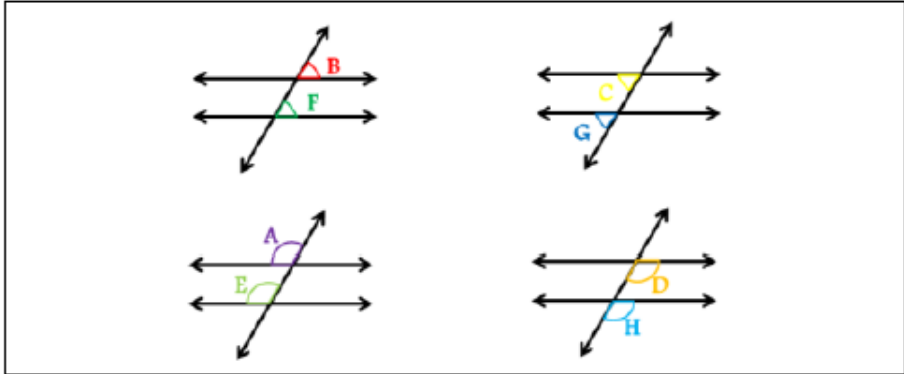
### **Converse of same side interior angle theorem**

– says that

“If same side interior angles are supplementary, then the lines that form them will be parallel to one another.”

<p style="text-align: center;"><b>Alternate Interior Angles</b></p>	<p>The pairs of angles located inside the parallel lines (interior) and on opposite sides (alternate) of the transversal. These angles are congruent.  <math>\angle 1 \cong \angle 2</math> and <math>\angle 3 \cong \angle 4</math></p>	 <p>The diagram shows two horizontal parallel lines, labeled <math>m</math> and <math>n</math>, with a transversal line intersecting them. The transversal is labeled <math>m \parallel n</math>. The angles are numbered: <math>\angle 1</math> is the top-left interior angle, <math>\angle 2</math> is the bottom-right interior angle, <math>\angle 3</math> is the top-right interior angle, and <math>\angle 4</math> is the bottom-left interior angle. A yellow box labeled "Alternate Interior Angles" is positioned above the transversal.</p>
<p style="text-align: center;"><b>Alternate Exterior Angles</b></p>	<p>The pairs of angles located outside the parallel lines (exterior) and on opposite sides (alternate) of the transversal. These angles are congruent.  <math>\angle 1 \cong \angle 2</math> and <math>\angle 3 \cong \angle 4</math></p>	 <p>The diagram is identical to the one above, showing two parallel lines <math>m</math> and <math>n</math> intersected by a transversal. The angles are numbered: <math>\angle 1</math> is the top-left exterior angle, <math>\angle 2</math> is the bottom-right exterior angle, <math>\angle 3</math> is the top-right exterior angle, and <math>\angle 4</math> is the bottom-left exterior angle. A yellow box labeled "Alternate Exterior Angles" is positioned above the transversal.</p>
<p style="text-align: center;"><b>Same Side Interior Angles</b></p>	<p>The pairs of angles located inside the parallel lines (interior) and on the same side of the transversal. These angles are supplementary.  <math>m\angle 1 + m\angle 2 = 180</math> and  <math>m\angle 3 + m\angle 4 = 180</math></p>	 <p>The diagram is identical to the one above, showing two parallel lines <math>m</math> and <math>n</math> intersected by a transversal. The angles are numbered: <math>\angle 1</math> is the top-left interior angle, <math>\angle 2</math> is the top-right interior angle, <math>\angle 3</math> is the bottom-left interior angle, and <math>\angle 4</math> is the bottom-right interior angle. A yellow box labeled "Interior Angles Same Side of Transversal" is positioned above the transversal.</p>
<p style="text-align: center;"><b>Same Side Exterior Angles</b></p>	<p>The pairs of angles located outside the parallel lines (exterior) and on the same side of the transversal. These angles are supplementary  <math>m\angle 1 + m\angle 7 = 180</math></p>	 <p>The diagram shows two horizontal parallel lines intersected by a transversal. The top-left exterior angle is labeled <math>1</math> and the bottom-left exterior angle is labeled <math>7</math>.</p>

<h1>Corresponding Angles</h1>	<p>These angles are in the same position in different intersections. If you translated one intersection to the other, the angles would correspond. They are congruent.</p>
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### Definition of Parallel Lines

– says that

“If lines in the same plane do not intersect,  
then the lines are parallel.”