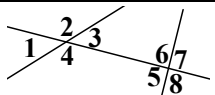
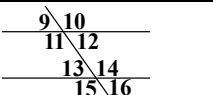
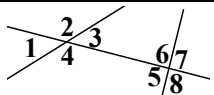
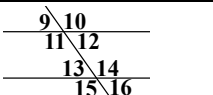
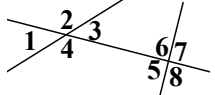
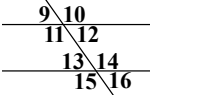
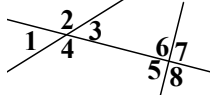
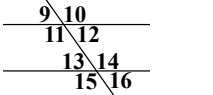


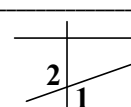
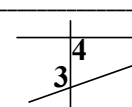
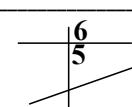
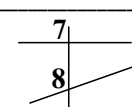
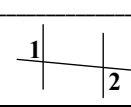
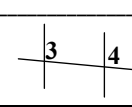
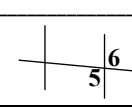
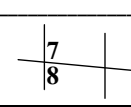
Identifying Angles on Lines Cut by a Transversal

Two lines cut by a **transversal** (the line going through them) create sets of angles where the lines intersect. These sets of angles have a relationship to one another. Before you can do any math on these angles, you need to be able to identify the angle pairs.

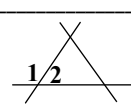
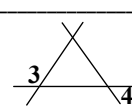
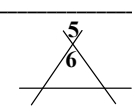
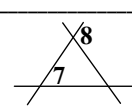
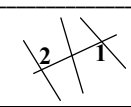
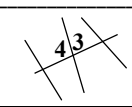
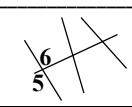
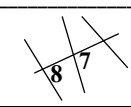
There are four pairs you must know. We have already talked about the first two.

VERTICAL ANGLES (angles across an X)	LINEAR PAIR (angles that make a line)
 $\angle 1$ & $\angle 3$; $\angle 2$ & $\angle 4$; $\angle 5$ & $\angle 7$; $\angle 6$ & $\angle 8$	 $\angle 9$ & $\angle 12$; $\angle 10$ & $\angle 11$; $\angle 13$ & $\angle 16$; $\angle 14$ & $\angle 15$
 $\angle 1$ & $\angle 2$; $\angle 1$ & $\angle 4$; $\angle 4$ & $\angle 3$; $\angle 2$ & $\angle 3$; $\angle 5$ & $\angle 6$; $\angle 5$ & $\angle 8$; $\angle 8$ & $\angle 7$; $\angle 6$ & $\angle 7$	 $\angle 9$ & $\angle 10$; $\angle 9$ & $\angle 11$; $\angle 11$ & $\angle 12$; $\angle 10$ & $\angle 12$; $\angle 13$ & $\angle 14$; $\angle 13$ & $\angle 15$; $\angle 15$ & $\angle 16$; $\angle 14$ & $\angle 16$
CORRESPONDING ANGLES (angles in matching places)	ALTERNATE ANGLES (angles in opposite places)
<p><i>Example: top left goes with top left</i></p>  $\angle 1$ & $\angle 5$; $\angle 2$ & $\angle 6$; $\angle 3$ & $\angle 7$; $\angle 4$ & $\angle 8$	<p><i>Example: top right goes with bottom left</i></p>  $\angle 9$ & $\angle 13$; $\angle 10$ & $\angle 14$; $\angle 11$ & $\angle 15$; $\angle 12$ & $\angle 16$
<p><i>Example: top left goes with bottom right</i></p>  $\angle 1$ & $\angle 7$; $\angle 2$ & $\angle 8$; $\angle 3$ & $\angle 5$; $\angle 4$ & $\angle 6$	<p><i>Example: top right goes with bottom left</i></p>  $\angle 9$ & $\angle 16$; $\angle 10$ & $\angle 15$; $\angle 11$ & $\angle 14$; $\angle 12$ & $\angle 13$

Identify each marked angle pair.

<p>1. $\angle 1$ & $\angle 2$ are _____ angles.</p> 	<p>2. $\angle 3$ & $\angle 4$ are _____ angles.</p> 	<p>3. $\angle 5$ & $\angle 6$ are _____ angles.</p> 	<p>4. $\angle 7$ & $\angle 8$ are _____ angles.</p> 
<p>5. $\angle 1$ & $\angle 2$ are _____ angles.</p> 	<p>6. $\angle 3$ & $\angle 4$ are _____ angles.</p> 	<p>7. $\angle 5$ & $\angle 6$ are _____ angles.</p> 	<p>8. $\angle 7$ & $\angle 8$ are _____ angles.</p> 

HINT: When there are too many lines, or too many angle crossings, cover up or cross out the extra and focus on the ones that you need.

<p>9. $\angle 1$ & $\angle 2$ are _____ angles.</p> 	<p>10. $\angle 3$ & $\angle 4$ are _____ angles.</p> 	<p>11. $\angle 5$ & $\angle 6$ are _____ angles.</p> 	<p>12. $\angle 7$ & $\angle 8$ are _____ angles.</p> 
<p>13. $\angle 1$ & $\angle 2$ are _____ angles.</p> 	<p>14. $\angle 3$ & $\angle 4$ are _____ angles.</p> 	<p>15. $\angle 5$ & $\angle 6$ are _____ angles.</p> 	<p>16. $\angle 7$ & $\angle 8$ are _____ angles.</p> 

Now that you know what the pairs are called, you need to know *how they are related*.

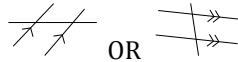
For **vertical (always congruent)** and **linear pair (always add to = 180°)** angles, their relationships are constant.

However, for **corresponding (sometimes congruent)** and **alternate (sometimes congruent)** angles, their relationships can only exist if the **lines are parallel**.

VERTICAL ANGLES (angles across an X)		LINEAR PAIR (angles that make a line)	
ARE ALWAYS CONGRUENT!!!		ALWAYS ADD TO EQUAL 180°!!!	
CORRESPONDING ANGLES (angles in matching places)		ALTERNATE ANGLES (angles in opposite places)	
When the lines are PARALLEL...	THEY ARE CONGRUENT!!!	When the lines are PARALLEL...	THEY ARE CONGRUENT!!!
When the lines are NOT PARALLEL...	THEY ARE NOT CONGRUENT!!!	When the lines are NOT PARALLEL...	THEY ARE NOT CONGRUENT!!!
ANY ANGLE PAIR THAT IS NOT ON THE ABOVE LIST...			
When the lines are PARALLEL...	THEY ADD TO = 180°!!!	When the lines are NOT PARALLEL...	THEY DO NOT ADD TO = 180°!!!

This means, you **must know** if the lines are **parallel or not** in order to know how **corresponding, alternate**, and any of the **unlisted** angles are related. There are two ways to be sure that the lines are parallel (it's not enough to guess):

1. The problem says so ("line *p* and line *q* are parallel" or "line *m* || line *n*")
2. The lines have markings (matching arrows) to tell you they're parallel.



First, identify the type of angle pair. Then, identify the relationship between that angle pair.

<p>EXAMPLE</p> <p>∠6 and ∠7 are <u>CORRESPONDING</u>.</p> <p>The lines are <u>NOT PARALLEL</u>.</p> <p>So, the angles <u>ARE NOT CONGRUENT</u>.</p>	<p>EXAMPLE</p> <p>∠2 and ∠3 are <u>VERTICAL</u>.</p> <p>The lines are <u>NOT PARALLEL</u>.</p> <p>So, the angles <u>ARE CONGRUENT</u>.</p>	<p>EXAMPLE</p> <p>∠5 and ∠6 are <u>UNLISTED</u>.</p> <p>The lines are <u>PARALLEL</u>.</p> <p>So, the angles <u>ADD TO EQUAL 180°</u>.</p>
<p>1.</p> <p>∠1 and ∠2 are _____.</p> <p>The lines are _____.</p> <p>So, the angles _____.</p>	<p>2.</p> <p>∠3 and ∠4 are _____.</p> <p>The lines are _____.</p> <p>So, the angles _____.</p>	<p>3.</p> <p>∠5 and ∠6 are _____.</p> <p>The lines are _____.</p> <p>So, the angles _____.</p>
<p>4.</p> <p>∠7 and ∠8 are _____.</p> <p>The lines are _____.</p> <p>So, the angles _____.</p>	<p>5.</p> <p>∠1 and ∠2 are _____.</p> <p>The lines are _____.</p> <p>So, the angles _____.</p>	<p>6.</p> <p>∠3 and ∠4 are _____.</p> <p>The lines are _____.</p> <p>So, the angles _____.</p>