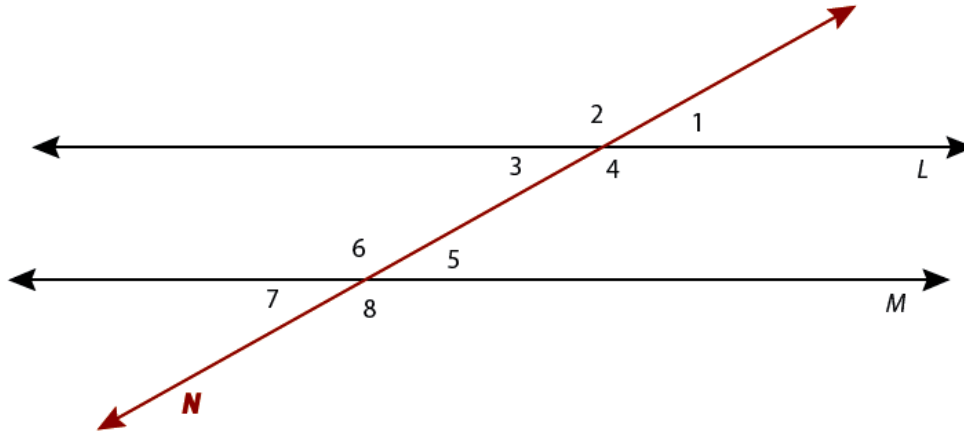


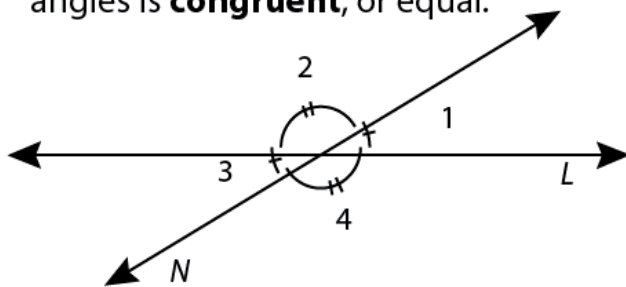
Angles Formed by Parallel Lines and a Transversal

If a set of two parallel lines, line L and line M , are crossed or cut by another line, line N , then line N is called the **transversal**.



At each intersection of the transversal and parallel lines there are four angles – angles 1, 2, 3, 4 and angles 5, 6, 7, 8. Many of these eight angles are equal. For example, angles 2, 4, 6, and 8 have the same measurement. Here is why...

The group of angles at each intersection is made up of two pairs of **vertical angles**, or opposite angles that share the same vertex (corner point). Each pair of vertical angles is **congruent**, or equal.



$\angle 1 \cong \angle 3$, angle 1 is congruent to angle 3.

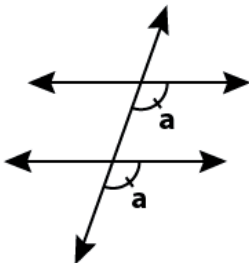
$\angle 2 \cong \angle 4$, angle 2 is congruent to angle 4.

$\angle 5 \cong \angle 7$, angle 5 is congruent to angle 7.

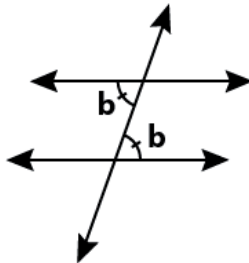
$\angle 6 \cong \angle 8$, angle 6 is congruent to angle 8.

A transversal line cutting through two parallel lines will create multiple pairs of congruent angles. Here are the names of congruent pairs that can be found:

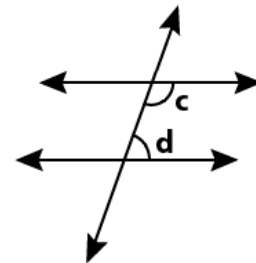
Corresponding Angles



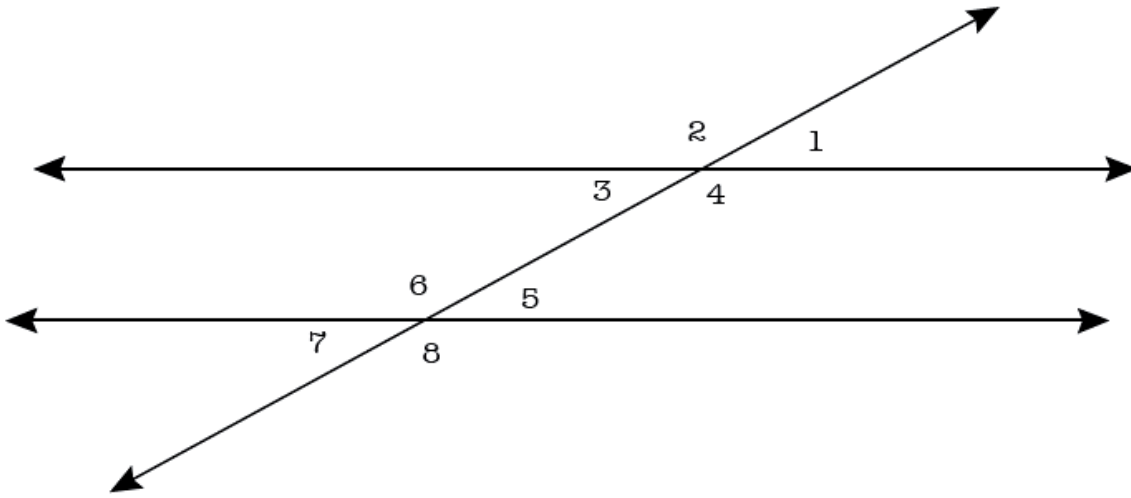
Alternate Angles



Co-interior Angles



$$c + d = 180^\circ$$



Decide whether each statement is TRUE or FALSE.

1. _____ $\angle 1$ and $\angle 2$ are supplementary angles.
2. _____ $\angle 1$ and $\angle 5$ are corresponding angles.
3. _____ $\angle 2$ and $\angle 5$ are alternate angles.
4. _____ $\angle 4$ and $\angle 6$ are co-interior angles.
5. _____ $\angle 7$ and $\angle 2$ are corresponding angles.
6. _____ $\angle 3$ and $\angle 6$ are co-interior angles.
7. _____ $\angle 3$ is congruent to $\angle 8$.
8. _____ $\angle 3$ and $\angle 7$ are corresponding angles.
9. _____ $\angle 3$ and $\angle 5$ are alternate angles.

Bonus: If the measure of $\angle 6$ is 112° , find the missing angle measures.

1. True, 2. True, 3. False, 4. False, 5. False, 6. True, 7. False, 8. True, 9. True

Bonus: $\angle 1 = 68^\circ$, $\angle 2 = 112^\circ$, $\angle 3 = 68^\circ$, $\angle 4 = 112^\circ$, $\angle 5 = 68^\circ$, $\angle 7 = 68^\circ$, $\angle 8 = 112^\circ$