

Explore Relationships Between Angles and Parallel Lines

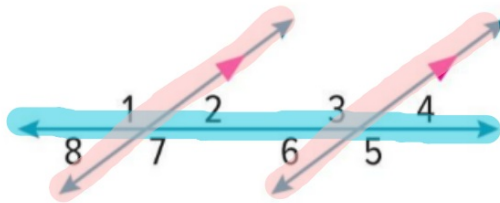


Use dynamic geometry software to complete the Explore.

INQUIRY How do parallel lines affect the relationships between special angle pairs?

Learn Angles and Parallel Lines

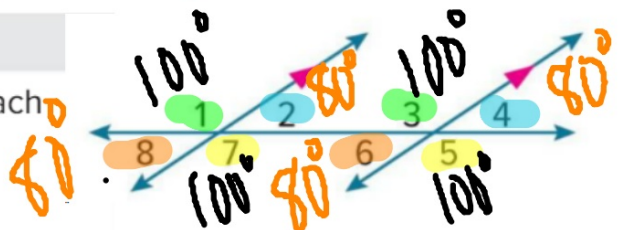
If two lines are **parallel** and cut by a **transversal**, then there are special relationships in the angle pairs formed by the lines.



Vertical
 $\angle 1 = \angle 3$
 $\angle 2 = \angle 4$

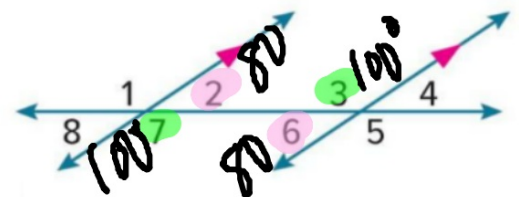
Theorem → Corresponding Angles Theorem

If two parallel lines are cut by a transversal, then each pair of corresponding angles is **congruent**.



Theorem → Alternate Interior Angles Theorem

If two parallel lines are cut by a transversal, then each pair of alternate interior angles is **congruent**.

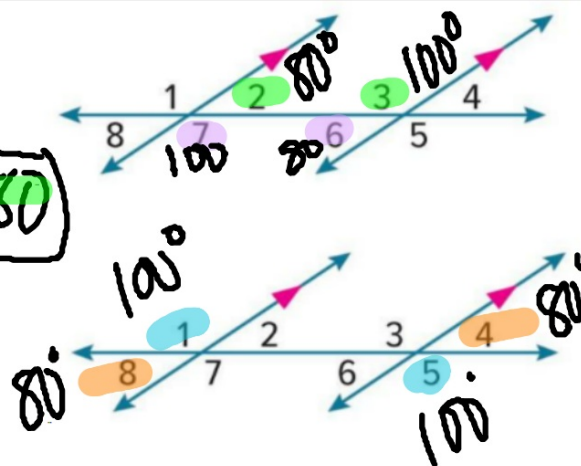


Theorem → Consecutive Interior Angles Theorem

If two parallel lines are cut by a transversal, then each pair of consecutive interior angles is supplementary. $= 180^\circ$

Theorem → Alternate Exterior Angles Theorem

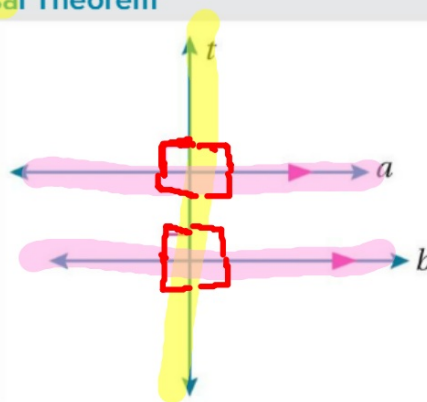
If two parallel lines are cut by a transversal, then each pair of alternate exterior angles is congruent.



Theorem 3.18: Perpendicular Transversal Theorem

In a plane, if a line is perpendicular to one of two parallel lines, then it is perpendicular to the other.

Example If $a \parallel b$ and $a \perp t$, then $b \perp t$.



90° (Right \angle)

perpendicular

90° Right