Parallel Lines and Transversals

When planes do not intersect, they are said to be parallel. Also, when lines in the same plane do not intersect, they are parallel. But when lines are not in the same plane and do not intersect, they are skew. A line that intersects two or more lines in a plane at different points is called a transversal. Eight angles are formed by a transversal and two lines. These angles and pairs of them have special names.

Example: Planes PQR and NOM are parallel.
Segments MO and RQ are parallel.
Segments MN and RQ are skew.

Example: Interior angles: \( \angle 1, \angle 2, \angle 5, \angle 6 \)
Alternate interior angles: \( \angle 1 \) and \( \angle 6, \angle 2 \) and \( \angle 5 \)
Consecutive interior angles: \( \angle 1 \) and \( \angle 5, \angle 2 \) and \( \angle 6 \)
Exterior angles: \( \angle 3, \angle 4, \angle 7, \angle 8 \)
Alternate exterior angles: \( \angle 3 \) and \( \angle 7, \angle 4 \) and \( \angle 8 \)
Corresponding angles: \( \angle 1 \) and \( \angle 7, \angle 2 \) and \( \angle 8, \angle 3 \) and \( \angle 6, \angle 4 \) and \( \angle 5 \)

Refer to the figure in the first example.
1. Name two more pairs of parallel segments.
2. Name two more segments skew to \( \overline{NM} \).
3. Name two transversals for parallel lines \( \overline{NO} \) and \( \overline{PQ} \).
4. Name a segment that is parallel to plane \( MRQ \).

Identify the special name for each pair of angles in the figure.
5. \( \angle 2 \) and \( \angle 6 \)
6. \( \angle 4 \) and \( \angle 8 \)
7. \( \angle 4 \) and \( \angle 5 \)
8. \( \angle 2 \) and \( \angle 5 \)
9. Draw a diagram to illustrate two parallel planes with a line intersecting the planes.