Intersecting and Parallel Lines

A. Fill in the Blanks

1. Angles that are in the same position at each intersection where a straight line crosses two others are called _____ angles.

2. If two parallel lines are cut by a transversal, then alternate interior angles are _____.

3. A line that intersects two or more coplanar lines at different points is called a _____.

4. Vertical angles are always _____ in measure.

5. If two lines are cut by a transversal such that the consecutive interior angles are _____, then the lines are parallel.
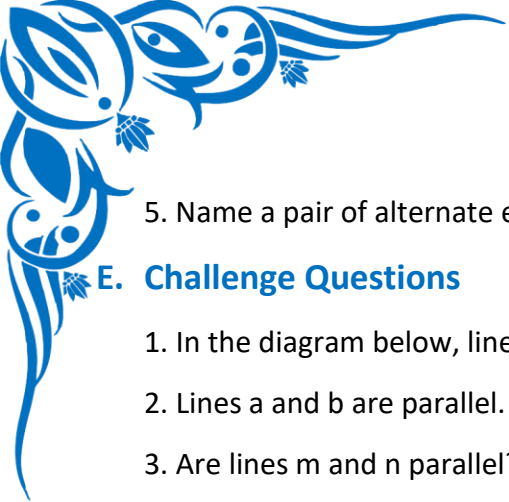
B. Match the Following;

Column A (Angle Pair)	Column B (Term)
1. ∠1 and ∠4	A. Alternate Interior Angles
2. ∠3 and ∠6	B. Corresponding Angles
3. ∠1 and ∠8	C. Consecutive Interior Angles
4. ∠4 and ∠5	D. Vertical Angles
5. ∠2 and ∠6	E. Alternate Exterior Angles

C. Practice Problems

1. If m∠1 = 75°, find m∠5. What is the relationship between these angles?

2. If m∠4 = 105°, find m∠5. What is the relationship between these angles?

3. If m∠3 = 80°, find m∠6. What is the relationship between these angles?

4. If m∠2 = 110°, find the measures of all other angles.

5. If m∠8 = 68°, find m∠1.

D. Warm-up Questions

1. Name the transversal line.

2. Angle 1 and Angle 5 are an example of what type of angle pair?

3. If the measure of ∠2 is 125°, what is the measure of ∠3?

4. If the measure of ∠6 is 55°, what is the measure of ∠7?

5. Name a pair of alternate exterior angles.

E. Challenge Questions

1. In the diagram below, line p is parallel to line q. Find the value of x.

2. Lines a and b are parallel. Lines c and d are also parallel. Find the values of x and y.

3. Are lines m and n parallel? Justify your answer based on the angle measures provided.

4. Find the measure of angle y. (Hint: Draw an auxiliary line parallel to the two parallel lines that passes through the vertex of angle y).

5. The angles of a triangle are given as (x + 10)°, (2x - 30)°, and (x + 40)°. A line parallel to the base of the triangle is drawn. What is the measure of the alternate interior angle to the angle (2x - 30)°?

F. Word Problems & Application

1. A city planner is designing a new neighborhood. Maple Street and Oak Avenue are parallel to each other. A new road, Pine Drive, will be built as a transversal. The angle Pine Drive makes with Maple Street at the northeast corner is 65°. What will be the angle at the southeast corner of the intersection of Pine Drive and Oak Avenue?

2. A ladder is leaning against a wall. The rungs of the ladder are parallel to the ground. If the angle the ladder makes with the ground is 70°, what is the measure of the corresponding angle that the ladder makes with each rung?

3. Two parallel train tracks are crossed by a road. The angle the road makes with the first track is 115°. What is the measure of the consecutive interior angle formed at the second track?

4. In a parking lot, the parking space lines are parallel. The angled line at the end of the row makes an angle of 60° with the curb. What is the measure of the alternate interior angle it makes with the last parking space line?

5. A wooden gate has a diagonal brace. The top and bottom rails of the gate are parallel. If the brace makes a 48° angle with the bottom rail, what angle does it make with the top rail on the same side of the brace (consecutive interior angle)?

G. True or False

1. Corresponding angles are always supplementary. _____

2. If a linear pair of angles are equal, they must both be 90°. _____

3. Any two lines in a plane that do not intersect are parallel. _____

4. Alternate exterior angles are located between the parallel lines. _____

5. If two lines are parallel, all eight angles created by a transversal are either equal or supplementary. ____