

## Properties of Angles with Parallel Lines

### A. Fill in the Blanks

1. When a transversal intersects two parallel lines, the alternate interior angles are \_\_\_\_\_.
2. Angles on the same side of the transversal and inside the parallel lines are called \_\_\_\_\_ interior angles.
3. If two corresponding angles are equal, then the lines intersected by the transversal must be \_\_\_\_\_.
4. Consecutive interior angles are \_\_\_\_\_, meaning they add up to  $180^\circ$ .
5. A line that intersects two or more other lines is called a \_\_\_\_\_.

### B. Match the angle pair from the diagram with its correct name. Lines a and b are parallel.

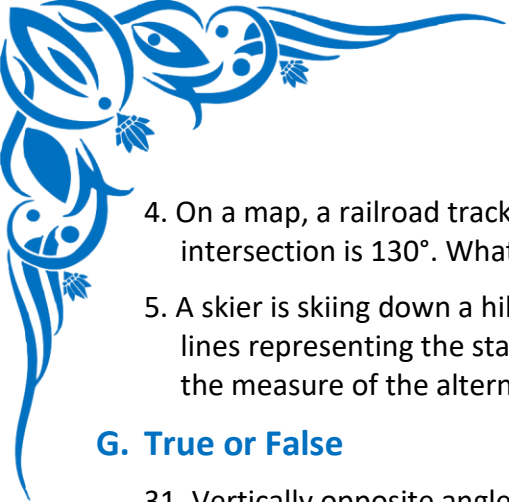
Column A (Angle Pair)	Column B (Name)
1. $\angle 1$ and $\angle 5$	A. Alternate Interior Angles
2. $\angle 4$ and $\angle 5$	B. Consecutive Interior Angles
3. $\angle 3$ and $\angle 6$	C. Corresponding Angles
4. $\angle 1$ and $\angle 4$	D. Vertically Opposite Angles
5. $\angle 5$ and $\angle 7$	E. Linear Pair (Angles on a straight line)

### D. Warm-up Questions

1. Name a pair of corresponding angles.
2. Name a pair of alternate interior angles.
3. If the measure of  $\angle 1$  is  $115^\circ$ , what is the measure of  $\angle 5$ ?
4. If the measure of  $\angle 4$  is  $65^\circ$ , what is the measure of  $\angle 5$ ?
5. If the measure of  $\angle 3$  is  $120^\circ$ , what is the measure of  $\angle 5$ ?

### F. Word Problems & Application

1. Two parallel city streets, Elm St. and Oak St., are crossed by a diagonal road, Maple Ave. The angle Maple Ave. makes with Elm St. is  $55^\circ$ . What is the measure of the corresponding angle it makes with Oak St.?
2. A carpenter is building a gate with a diagonal brace as shown. The top and bottom bars of the gate are parallel. If the angle the brace makes with the bottom bar ( $\angle 1$ ) is  $40^\circ$ , what is the measure of  $\angle 2$  to ensure the brace is straight?
3. The rungs of a ladder are parallel. If the ladder's side makes a  $75^\circ$  angle with the ground, what angle does the side make with the top rung (angle x)?



4. On a map, a railroad track crosses two parallel highways. The obtuse angle formed at the first intersection is  $130^\circ$ . What is the measure of the acute angle formed at the second intersection?
5. A skier is skiing down a hill. The path of the skier can be seen as a transversal cutting across two parallel lines representing the start and finish lines. If the angle of her path with the start line is  $110^\circ$ , what is the measure of the alternate interior angle at the finish line?

#### G. True or False

31. Vertically opposite angles are always supplementary. \_\_\_\_\_
32. If two lines are parallel, then alternate interior angles are supplementary. \_\_\_\_\_
33. All acute angles in a diagram with two parallel lines and a transversal are equal. \_\_\_\_\_
34. Angles that form a linear pair add up to  $360^\circ$ . \_\_\_\_\_
35. If a transversal is perpendicular to one of two parallel lines, it is not necessarily perpendicular to the other. \_\_\_\_\_