

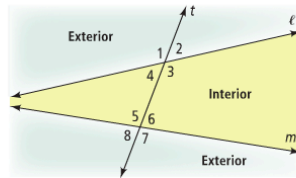
# 3-1 Lines and Angles

**Content Standards**  
 G.CO.1 Know precise definitions of ... parallel line.  
 Prepares for G.CO.9 Prove theorems about lines and angles.

**Objectives** To identify relationships between figures in space  
 To identify angles formed by two lines and a transversal

**Essential Understanding** When a line intersects two or more lines, the angles formed at the intersection points create special angle pairs.

A **transversal** is a line that intersects two or more coplanar lines at distinct points. The diagram below shows the eight angles formed by a transversal  $t$  and two lines  $\ell$  and  $m$ .



Notice that angles 3, 4, 5, and 6 lie between  $\ell$  and  $m$ . They are *interior* angles. Angles 1, 2, 7, and 8 lie outside of  $\ell$  and  $m$ . They are *exterior* angles.

Take note

## Key Concept Angle Pairs Formed by Transversals

**Definition**

**Alternate interior angles** are nonadjacent interior angles that lie on opposite sides of the transversal.

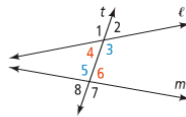
**Same-side interior angles** are interior angles that lie on the same side of the transversal.

**Corresponding angles** lie on the same side of the transversal  $t$  and in corresponding positions.

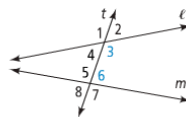
**Alternate exterior angles** are nonadjacent exterior angles that lie on opposite sides of the transversal.

**Example**

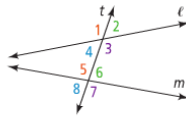
$\angle 4$  and  $\angle 6$   
 $\angle 3$  and  $\angle 5$



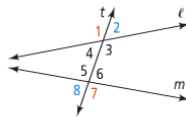
$\angle 4$  and  $\angle 5$   
 $\angle 3$  and  $\angle 6$



$\angle 1$  and  $\angle 5$   
 $\angle 4$  and  $\angle 8$   
 $\angle 2$  and  $\angle 6$   
 $\angle 3$  and  $\angle 7$

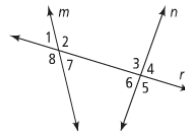


$\angle 1$  and  $\angle 7$   
 $\angle 2$  and  $\angle 8$



Example 1: Name pairs of:

- corresponding angles
- alternate interior angles
- alternate exterior angles
- same-side interior angles



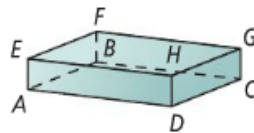


## Lesson Check

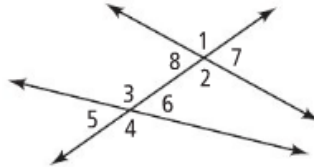
### Do you know HOW?

Name one pair each of the segments, planes, or angles.  
Lines and planes that appear to be parallel are parallel.

1. parallel segments
2. skew segments
3. parallel planes
4. alternate interior
5. same-side interior
6. corresponding
7. alternate exterior



Exercises 1–3



Exercises 4–7