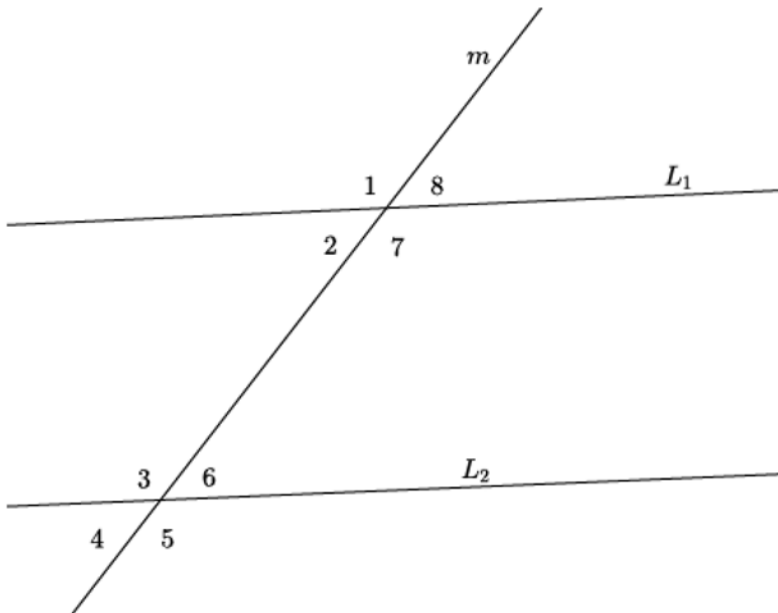


Name \_\_\_\_\_

Date \_\_\_\_\_

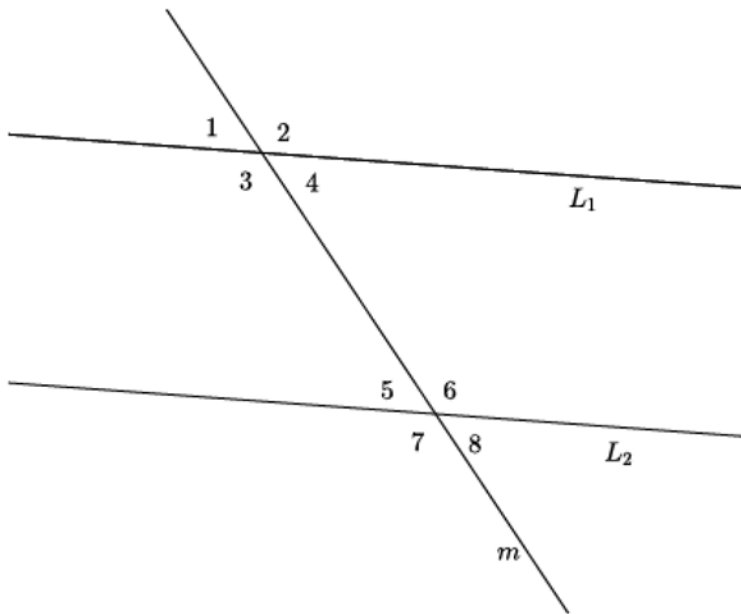
## Angles Associated with Parallel Lines

Use the diagram to answer Questions 1 and 2. In the diagram, lines  $L_1$  and  $L_2$  are intersected by transversal  $m$ , forming angles 1–8, as shown.



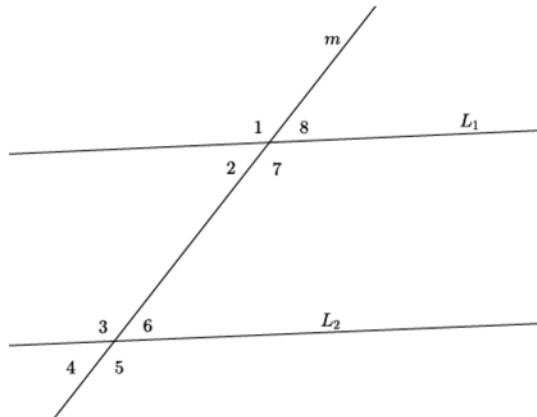
1. If  $L_1 \parallel L_2$ , what do you know about  $\angle 2$  and  $\angle 6$ ? Use informal arguments to support your claim.
  
  
  
  
  
  
  
  
  
  
2. If  $L_1 \parallel L_2$ , what do you know about  $\angle 1$  and  $\angle 3$ ? Use informal arguments to support your claim.

Use the diagram below to do Problems 1–6.



1. Identify all pairs of corresponding angles. Are the pairs of corresponding angles equal in measure? How do you know?
2. Identify all pairs of alternate interior angles. Are the pairs of alternate interior angles equal in measure? How do you know?
3. Use an informal argument to describe why  $\angle 1$  and  $\angle 8$  are equal in measure if  $L_1 \parallel L_2$ .
4. Assuming  $L_1 \parallel L_2$  if the measure of  $\angle 4$  is  $73^\circ$ , what is the measure of  $\angle 8$ ? How do you know?
5. Assuming  $L_1 \parallel L_2$ , if the measure of  $\angle 3$  is  $107^\circ$  degrees, what is the measure of  $\angle 6$ ? How do you know?
6. Assuming  $L_1 \parallel L_2$ , if the measure of  $\angle 2$  is  $107^\circ$ , what is the measure of  $\angle 7$ ? How do you know?
7. Would your answers to Problems 4–6 be the same if you had not been informed that  $L_1 \parallel L_2$ ? Why, or why not?
8. Use an informal argument to describe why  $\angle 1$  and  $\angle 5$  are equal in measure if  $L_1 \parallel L_2$ .
9. Use an informal argument to describe why  $\angle 4$  and  $\angle 5$  are equal in measure if  $L_1 \parallel L_2$ .
10. Assume that  $L_1$  is not parallel to  $L_2$ . Explain why  $\angle 3 \neq \angle 7$ .

Use the diagram to answer Questions 1 and 2. In the diagram, lines  $L_1$  and  $L_2$  are intersected by transversal  $m$ , forming angles 1–8, as shown.



1. If  $L_1 \parallel L_2$ , what do you know about  $\angle 2$  and  $\angle 6$ . Use informal arguments to support your claim.

*They are alternate interior angles because they are on opposite sides of the transversal and inside of lines  $L_1$  and  $L_2$ . Also, the angles are equal in measure because the lines  $L_1$  and  $L_2$  are parallel. If we rotated angle 2 around the midpoint of the segment between the parallel lines, then it would map onto angle 6.*

2. If  $L_1 \parallel L_2$ , what do you know about  $\angle 1$  and  $\angle 3$ ? Use informal arguments to support your claim.

*They are corresponding angles because they are on the same side of the transversal and above each of lines  $L_1$  and  $L_2$ . Also, the angles are equal in measure because the lines  $L_1$  and  $L_2$  are parallel. If we translated angle 1 along a vector (the same length as the segment between the parallel lines), then it would map onto angle 3.*

Students practice identifying corresponding, alternate interior, and alternate exterior angles from a diagram.

Use the diagram below to do Problems 1–6.

