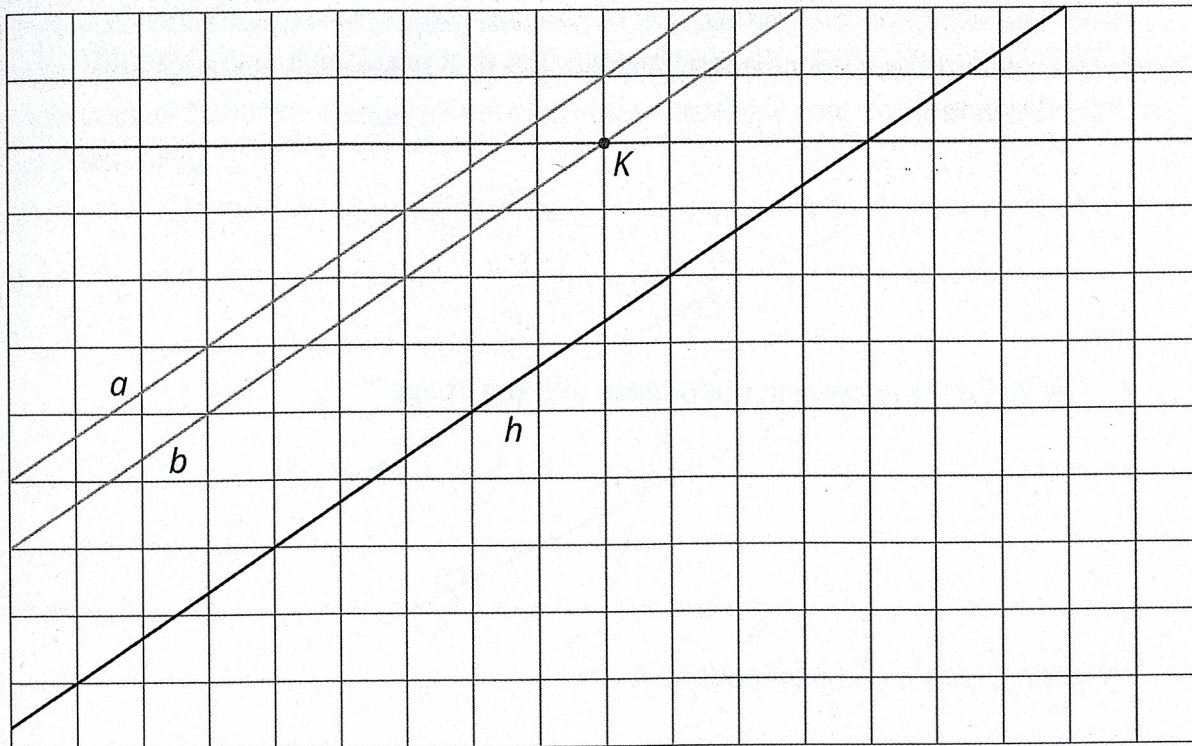


Unit 1 lesson 9  
9.2: Parallel Lines



Use a piece of tracing paper to trace lines  $a$  and  $b$  and point  $K$ . Then use that tracing paper to draw the images of the lines under the three different transformations listed.

As you perform each transformation, think about the question:

What is the image of two parallel lines under a rigid transformation?

1. Translate lines  $a$  and  $b$  3 units up and 2 units to the right.

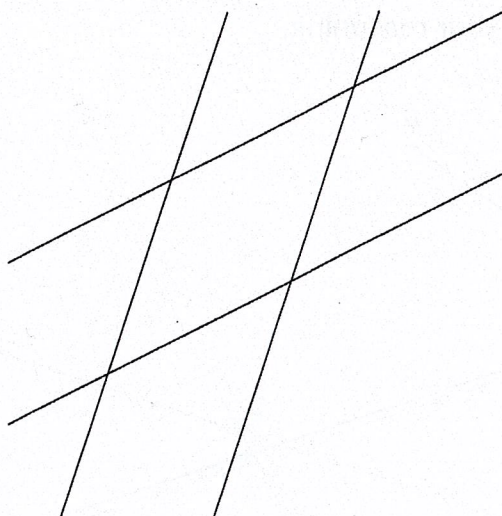
a. What do you notice about the changes that occur to lines  $a$  and  $b$  after the translation?

b. What is the same in the original and the image?



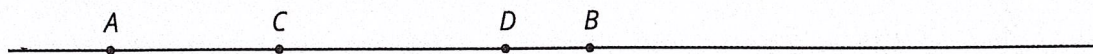
**Are you ready for more?**

When you rotate two parallel lines, sometimes the two original lines intersect their images and form a quadrilateral. What is the most specific thing you can say about this quadrilateral? Can it be a square? A rhombus? A rectangle that isn't a square? Explain your reasoning.



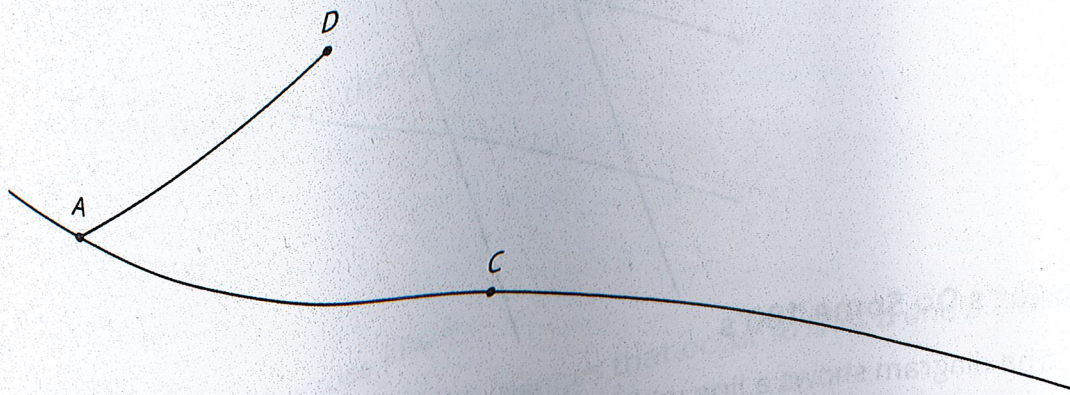
**9.3: Let's Do Some 180's**

1. The diagram shows a line with points labeled  $A$ ,  $C$ ,  $D$ , and  $B$ .
  - a. On the diagram, draw the image of the line and points  $A$ ,  $C$ , and  $B$  after the line has been rotated 180 degrees around point  $D$ .
  - b. Label the images of the points  $A'$ ,  $B'$ , and  $C'$ .
  - c. What is the order of all seven points? Explain or show your reasoning.





2. The diagram shows a line with points  $A$  and  $C$  on the line and a segment  $AD$  where  $D$  is not on the line.
- Rotate the figure 180 degrees about point  $C$ . Label the image of  $A$  as  $A'$  and the image of  $D$  as  $D'$ .
  - What do you know about the relationship between angle  $CAD$  and angle  $CA'D'$ ? Explain or show your reasoning.

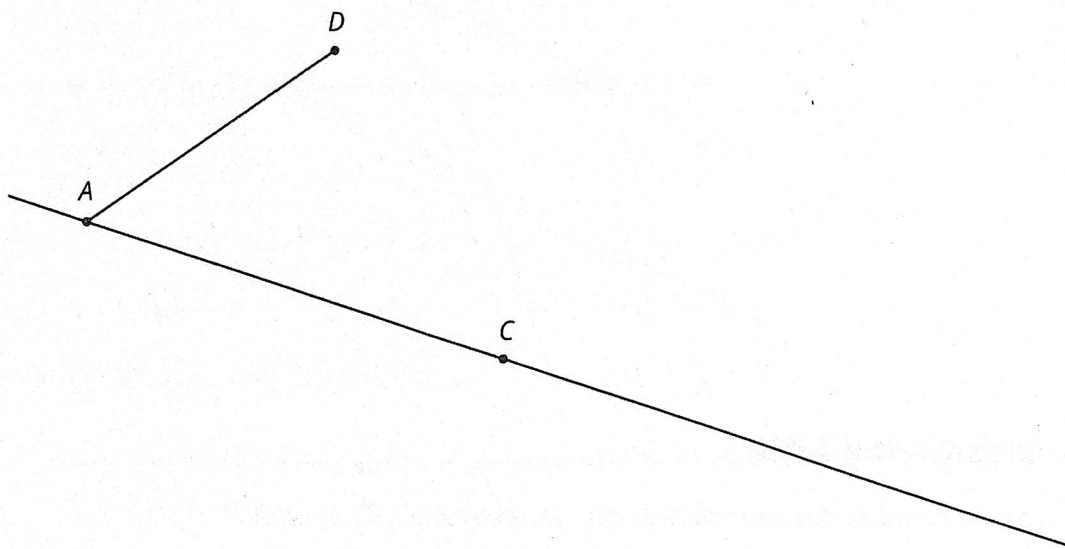




2. The diagram shows a line with points  $A$  and  $C$  on the line and a segment  $AD$  where  $D$  is not on the line.

a. Rotate the figure 180 degrees about point  $C$ . Label the image of  $A$  as  $A'$  and the image of  $D$  as  $D'$ .

b. What do you know about the relationship between angle  $CAD$  and angle  $CA'D'$ ? Explain or show your reasoning.





3. The diagram shows two lines  $\ell$  and  $m$  that intersect at a point  $O$  with point  $A$  on  $\ell$  and point  $D$  on  $m$ .

a. Rotate the figure 180 degrees around  $O$ . Label the image of  $A$  as  $A'$  and the image of  $D$  as  $D'$ .

b. What do you know about the relationship between the angles in the figure? Explain or show your reasoning.

