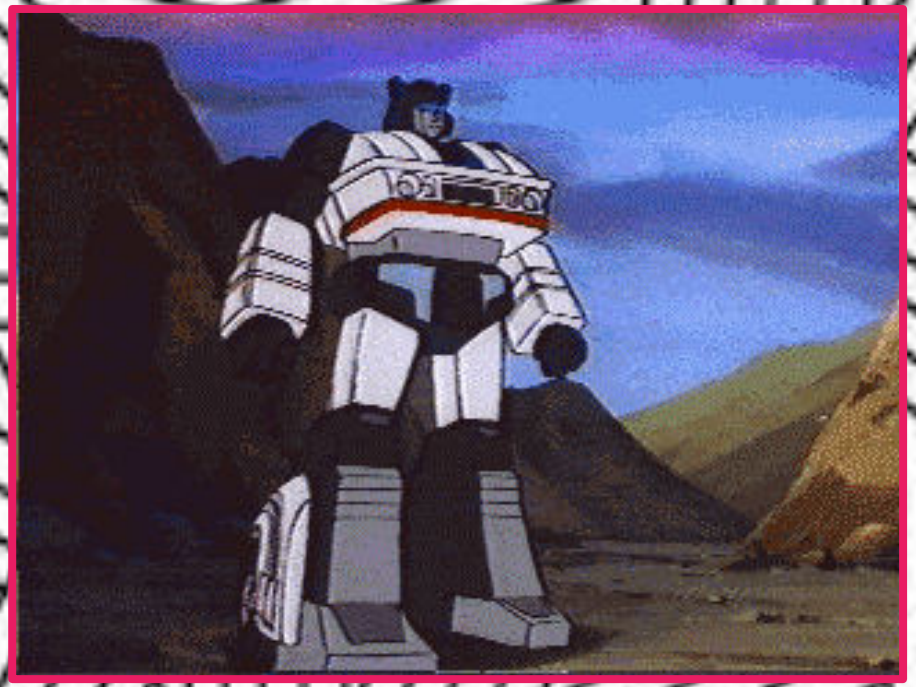
Moves in Parallel

Lesson 9

CCSS Standards: Building on	• 7.G.B.5
CCSS Standards: Addressing	• 8.G.A.1.a • 8.G.A.1.b • 8.G.A.1.c

Let’s transform some lines!

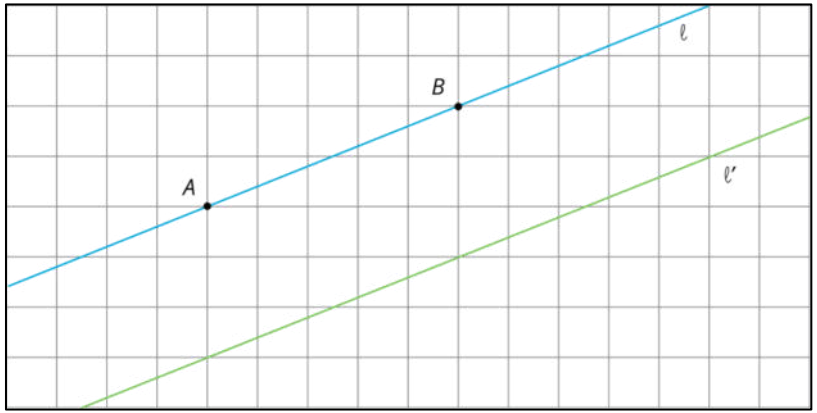


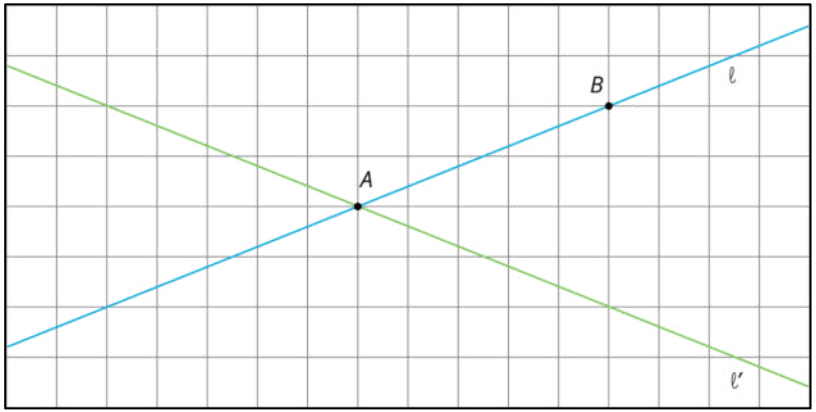
Line Moves

Warm-Up 9.1

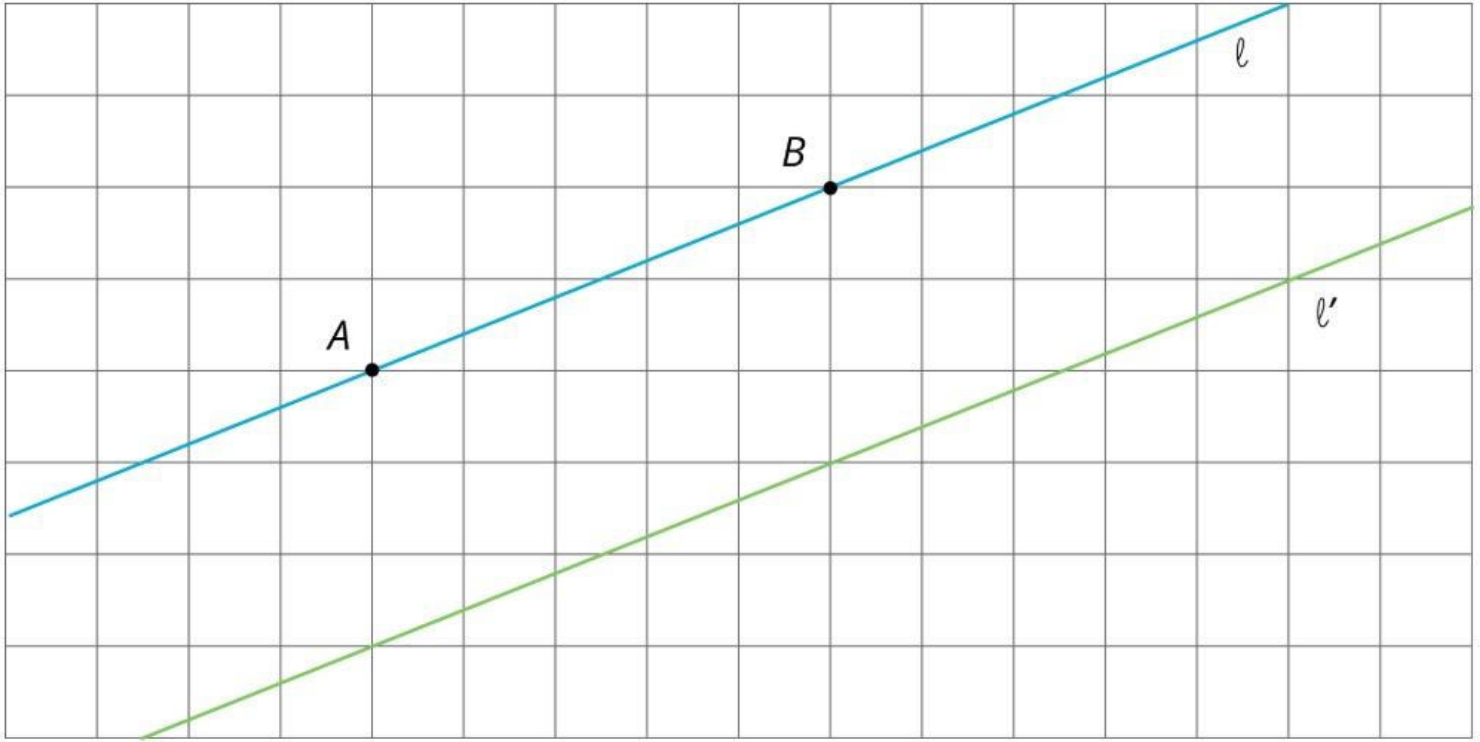
Begin with Quiet Work Time.

(2 min)

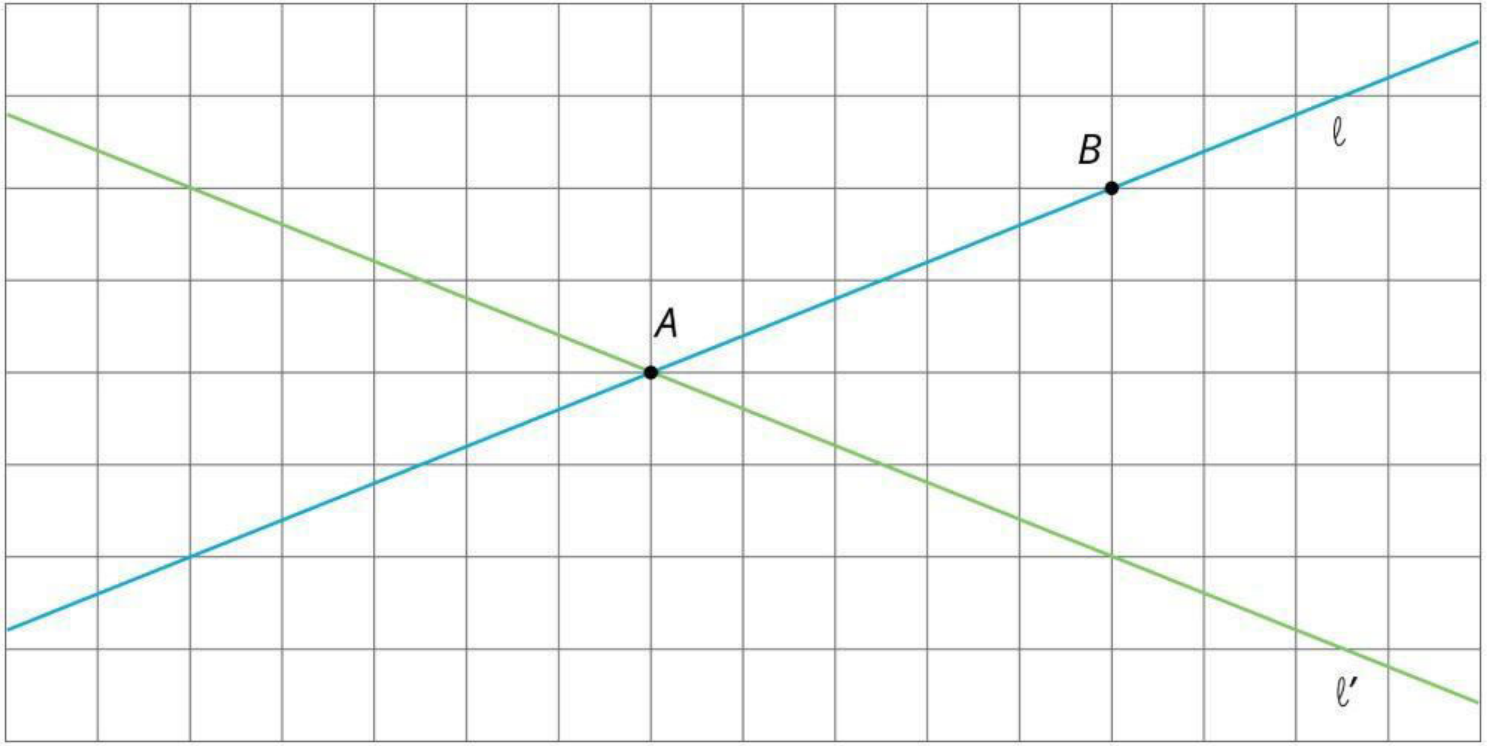




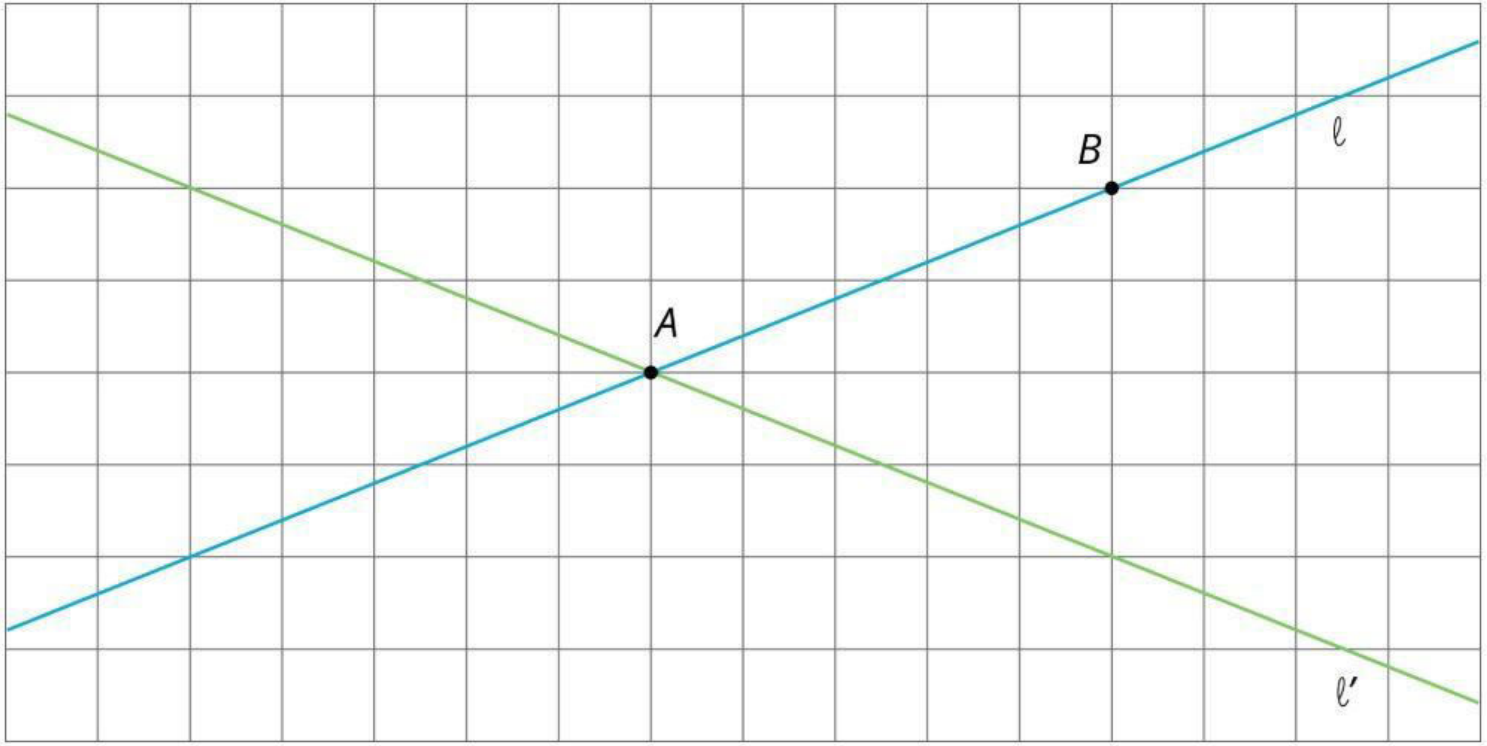
Describe a translation, rotation, or reflection that takes line l to line l'. Then plot and label A' and B', the images of A and B.



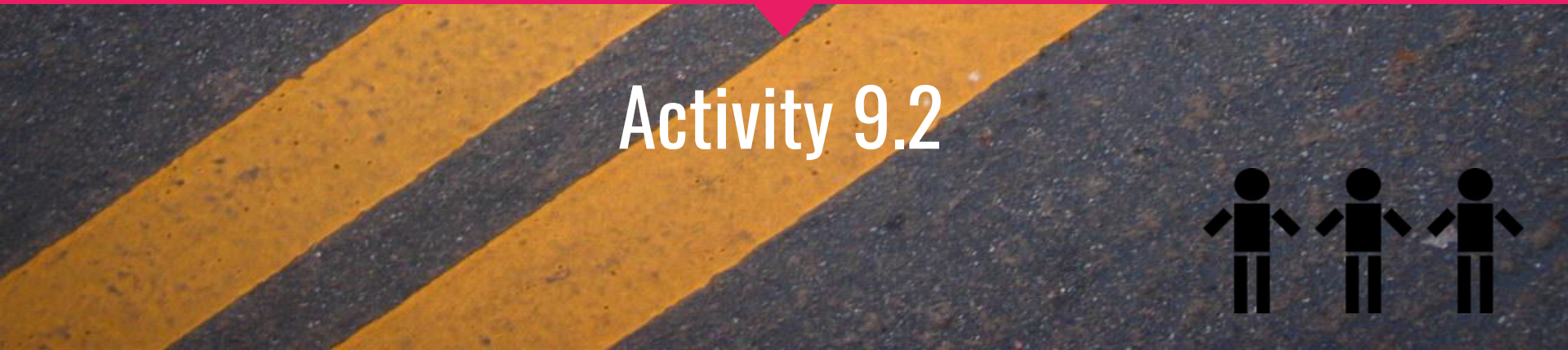
Describe a translation, rotation, or reflection that takes line l to line l'. Then plot and label A' and B', the images of A and B.



Will a translation work for this diagram? Why or why not?

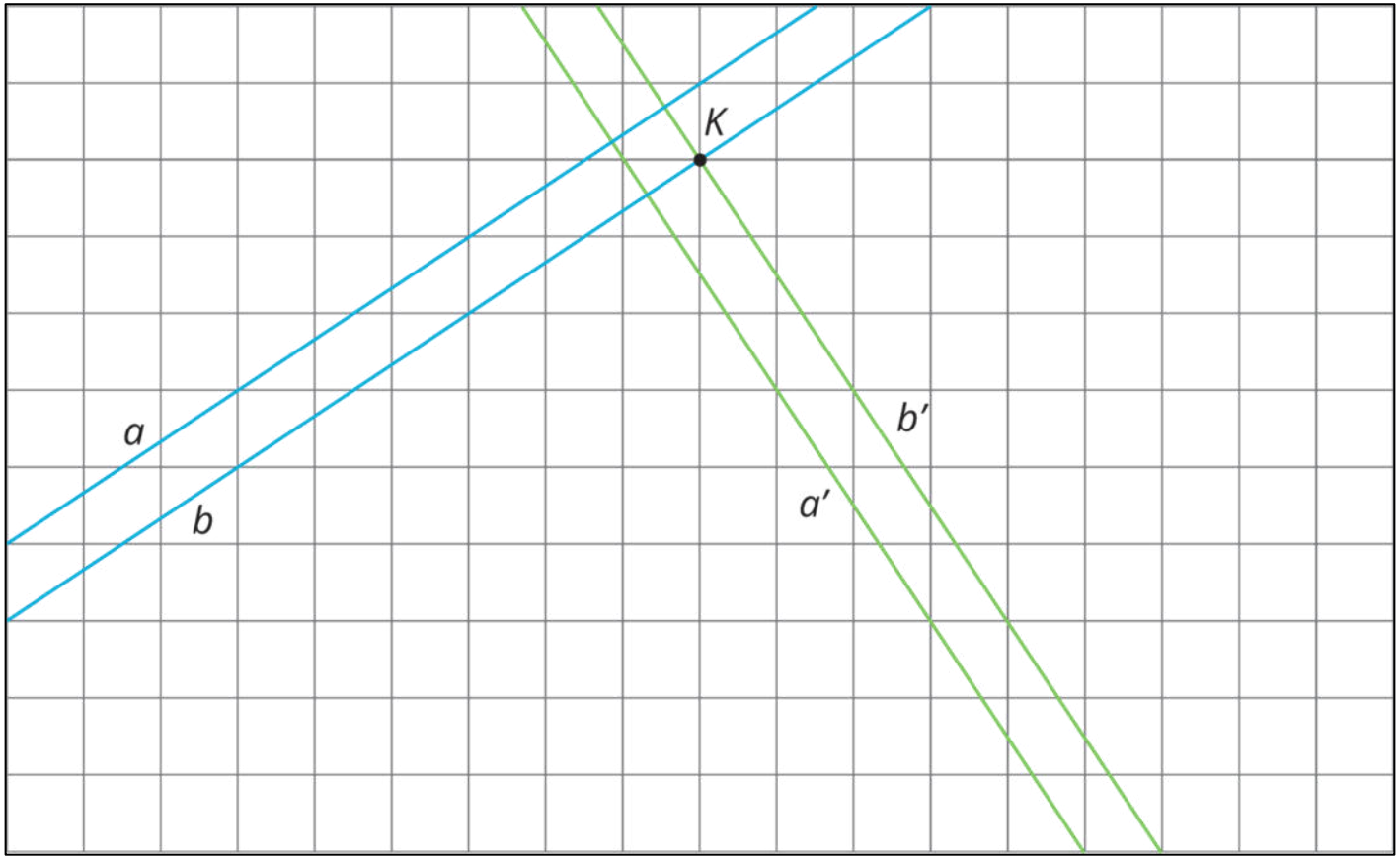


Parallel Lines



Activity 9.2

What happens when we perform a rigid transformation?



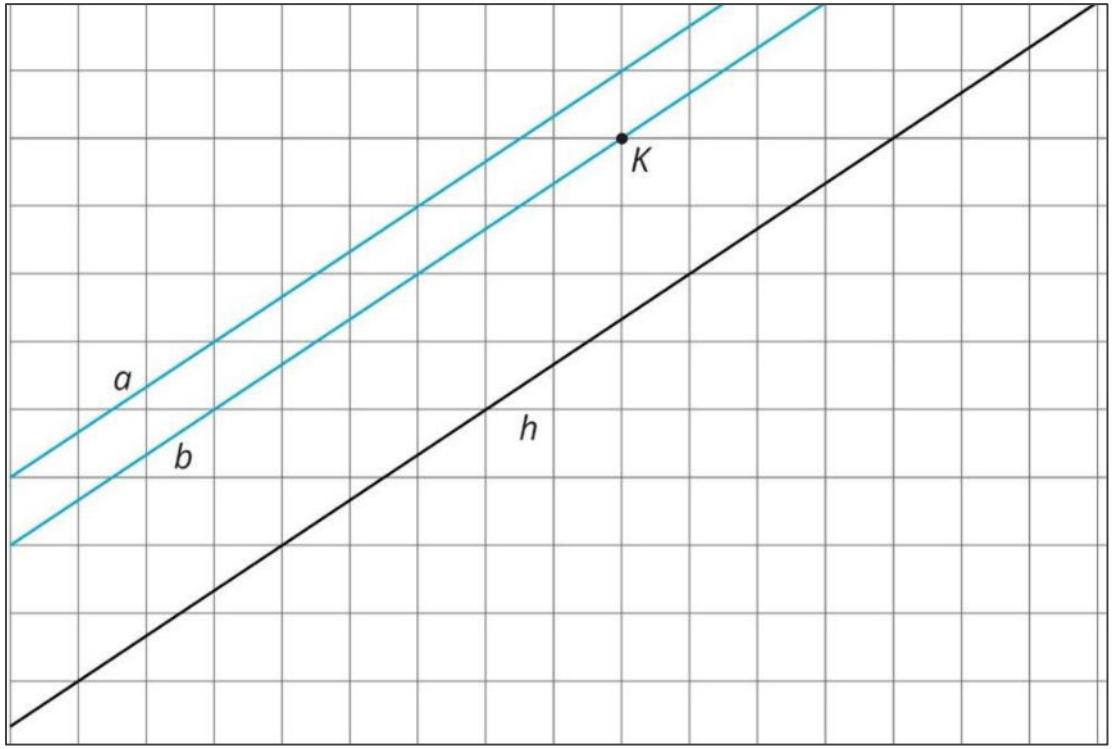
This activity, we'll investigate this question:

What happens to parallel lines when we perform rigid transformations on them?

Each person in your group will complete one of the problems listed.

Then discuss your findings together.

(8 min)

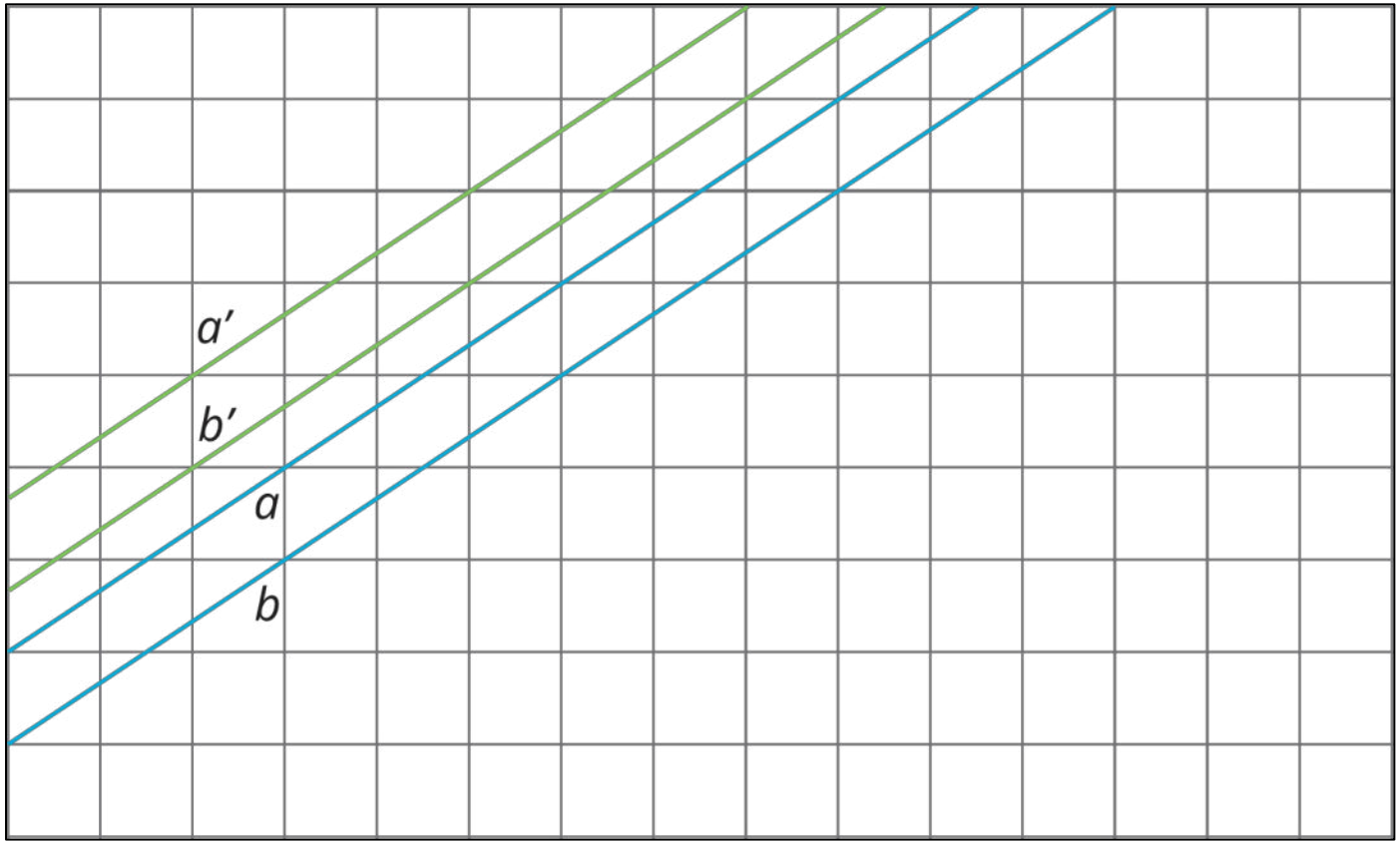


Note: *Line h* is only used for the reflection in Question 3.

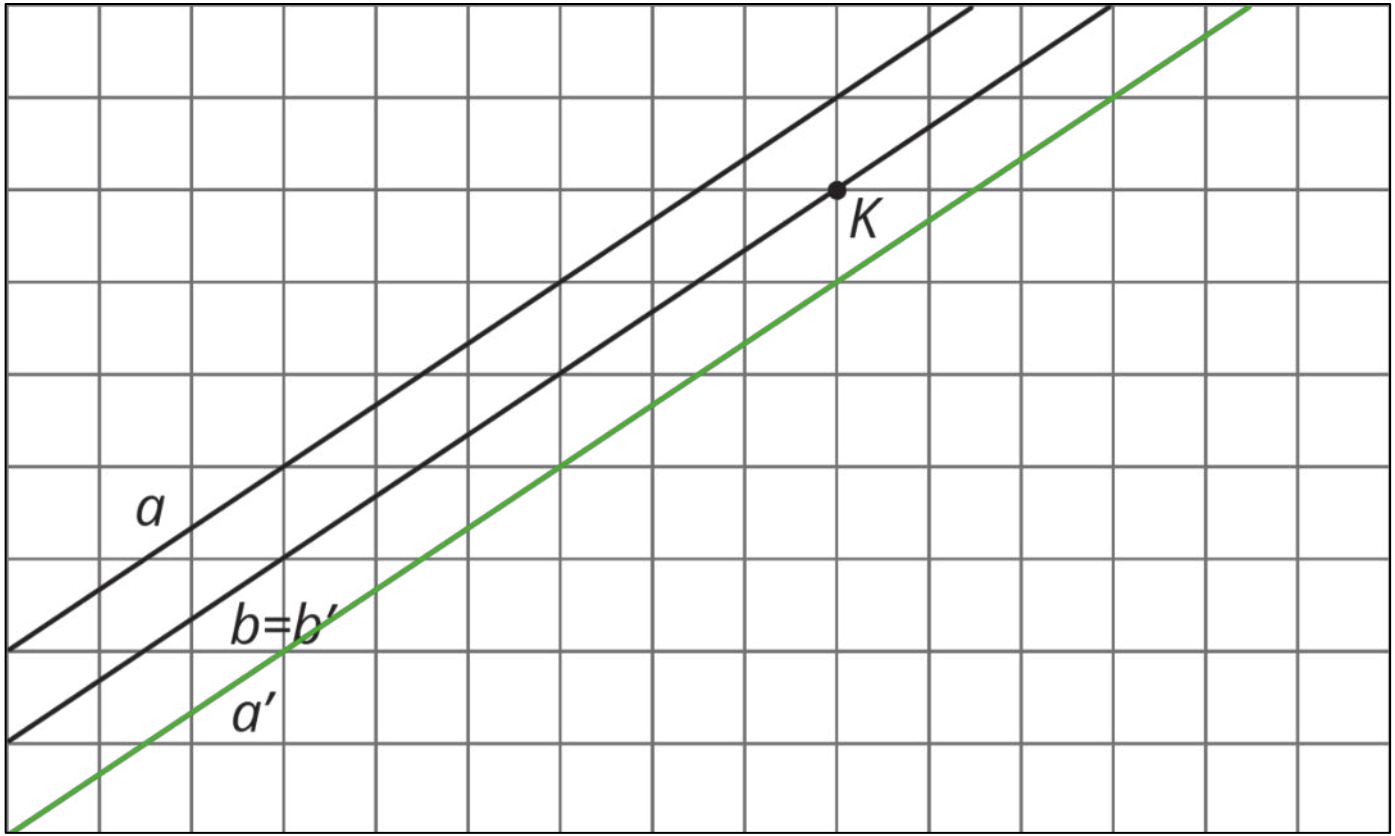
What did you notice about the changes that occured after the...

- translation?
- rotation?
- reflection?

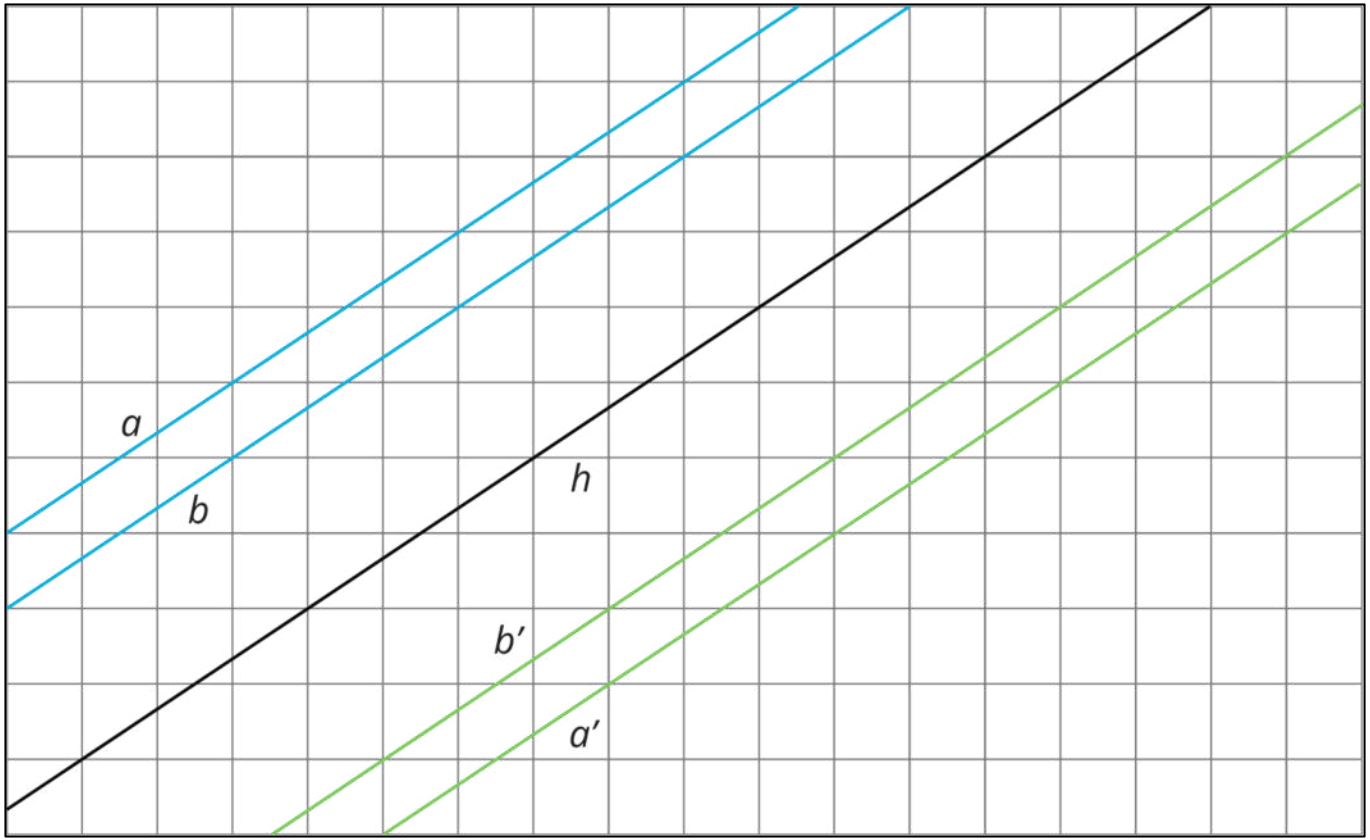
What do you notice about the changes that occur after the **translation**?



What do you notice about the changes that occur after the **rotation**?



What do you notice about the changes that occur after the **reflection**?



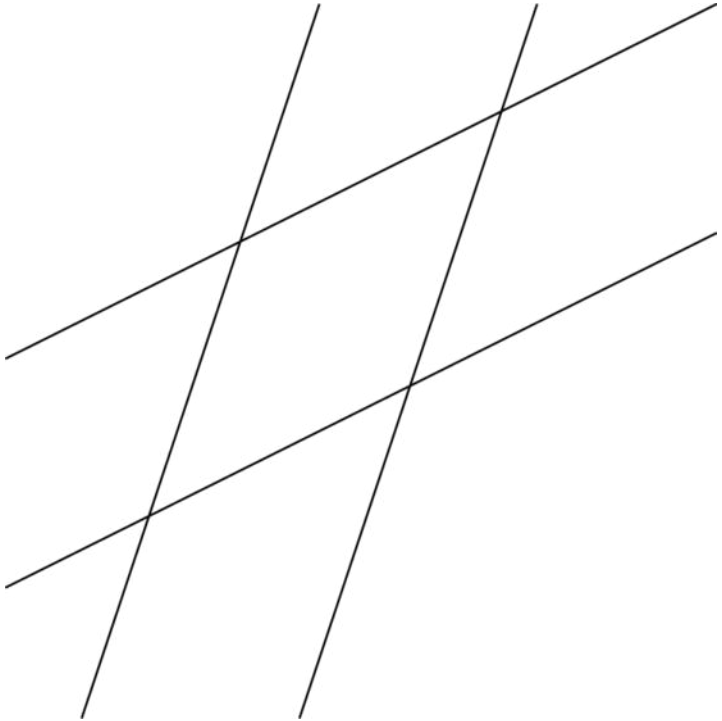
Write a response: (2 min)

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

“Are you ready for more?”

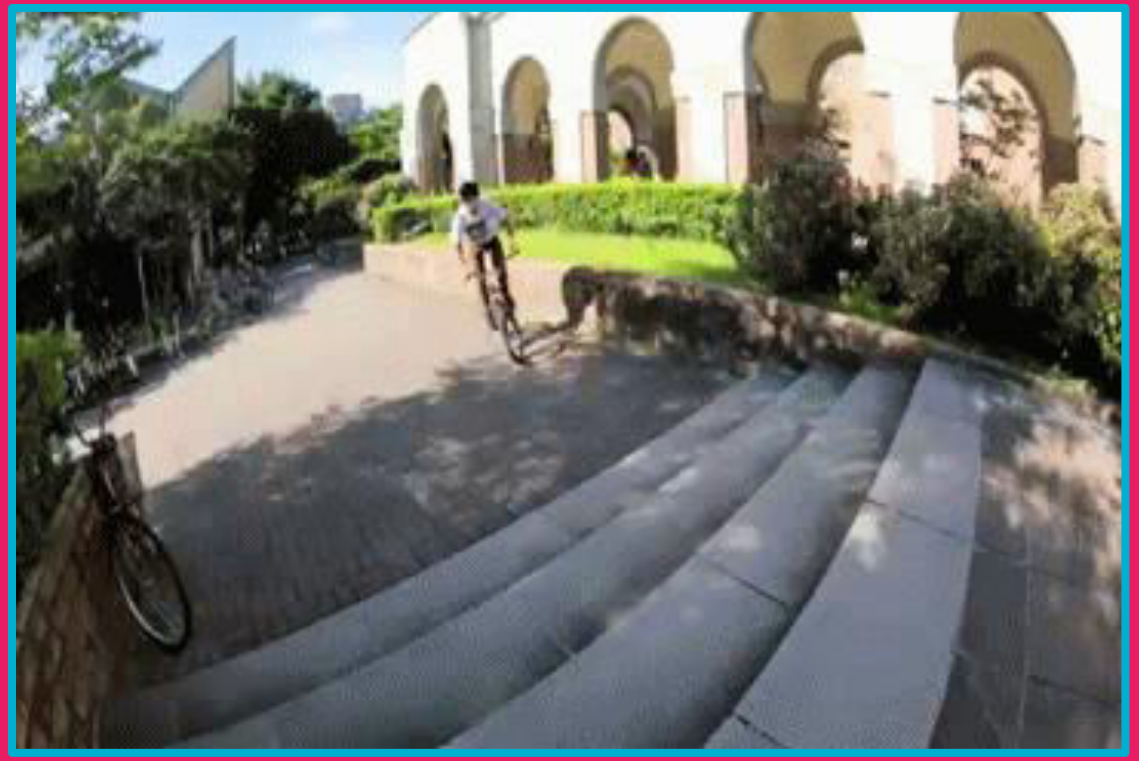
When you rotate two parallel lines, sometimes the two original lines intersect their images and form a quadrilateral.

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.

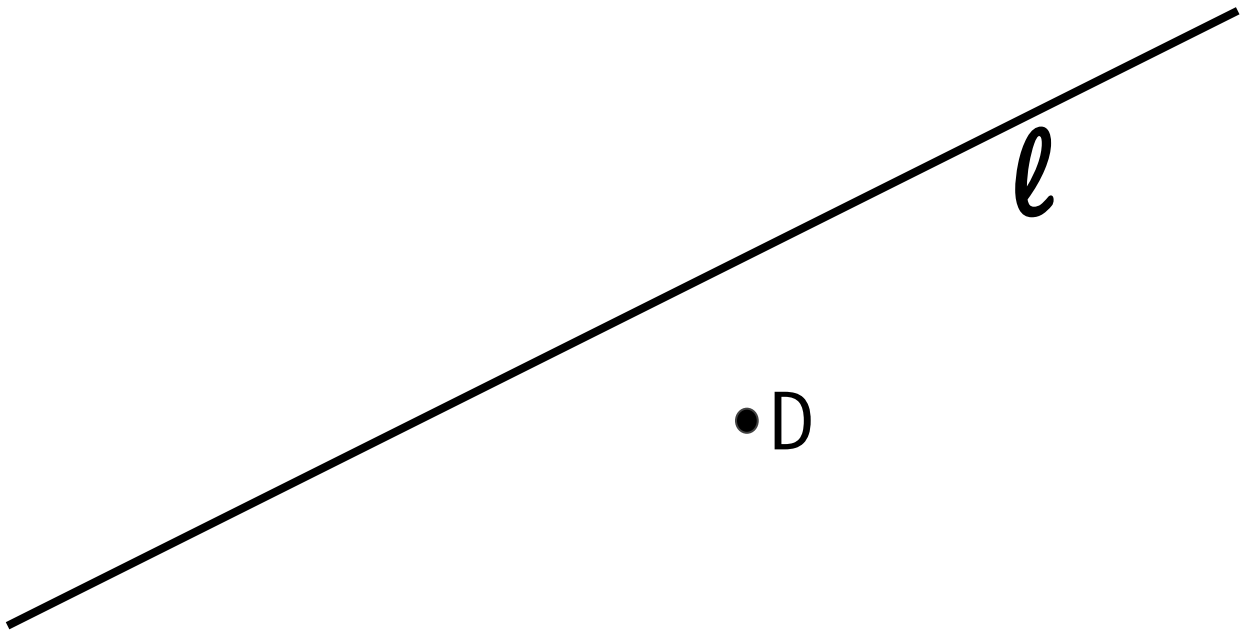


Let’s Do Some 180’s

Activity 9.3

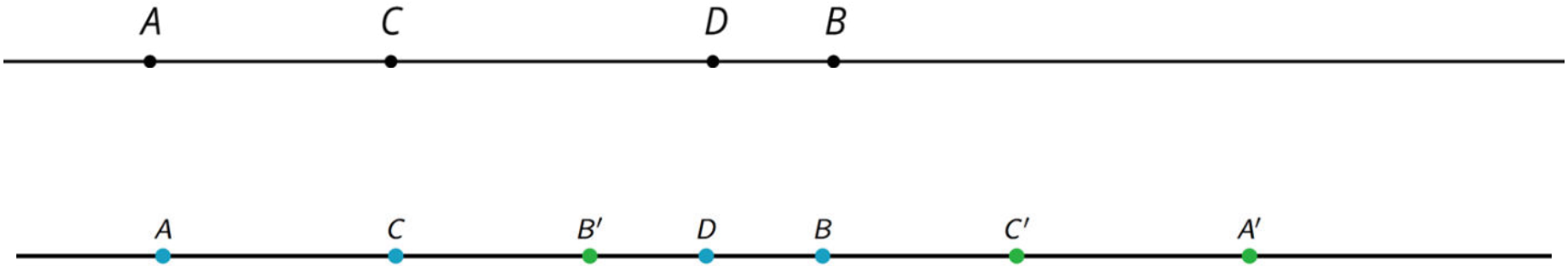


What would line ℓ look like if it was rotated 180 degrees around point D?

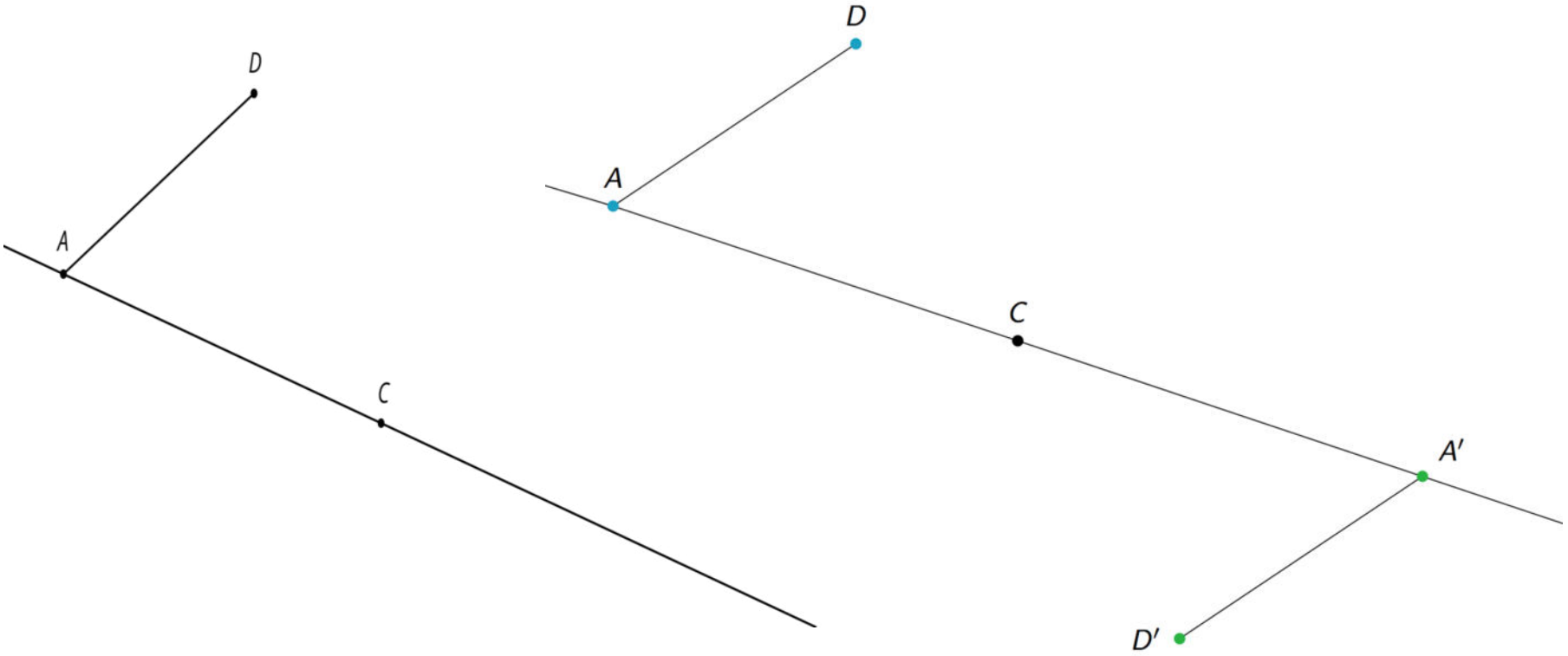


Begin working with Quiet Work Time.
Share your thinking as a team.

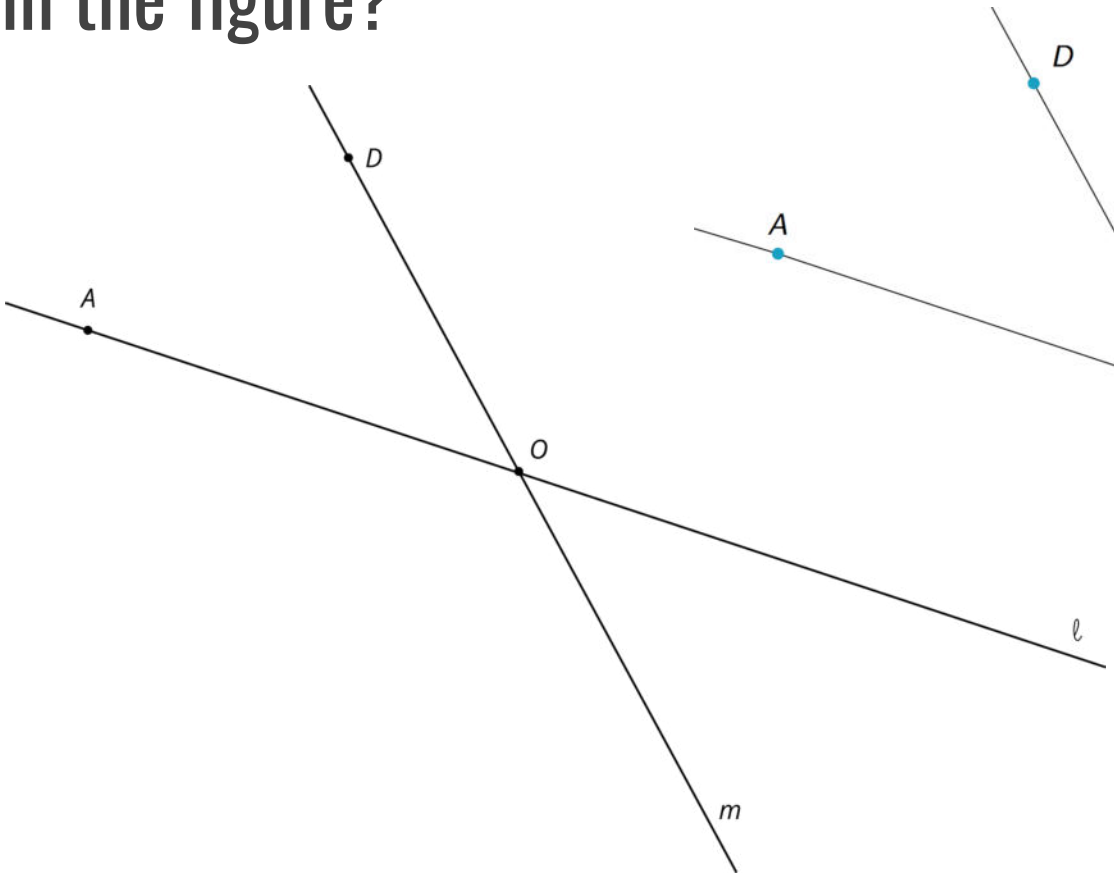
What is the order of the seven points?

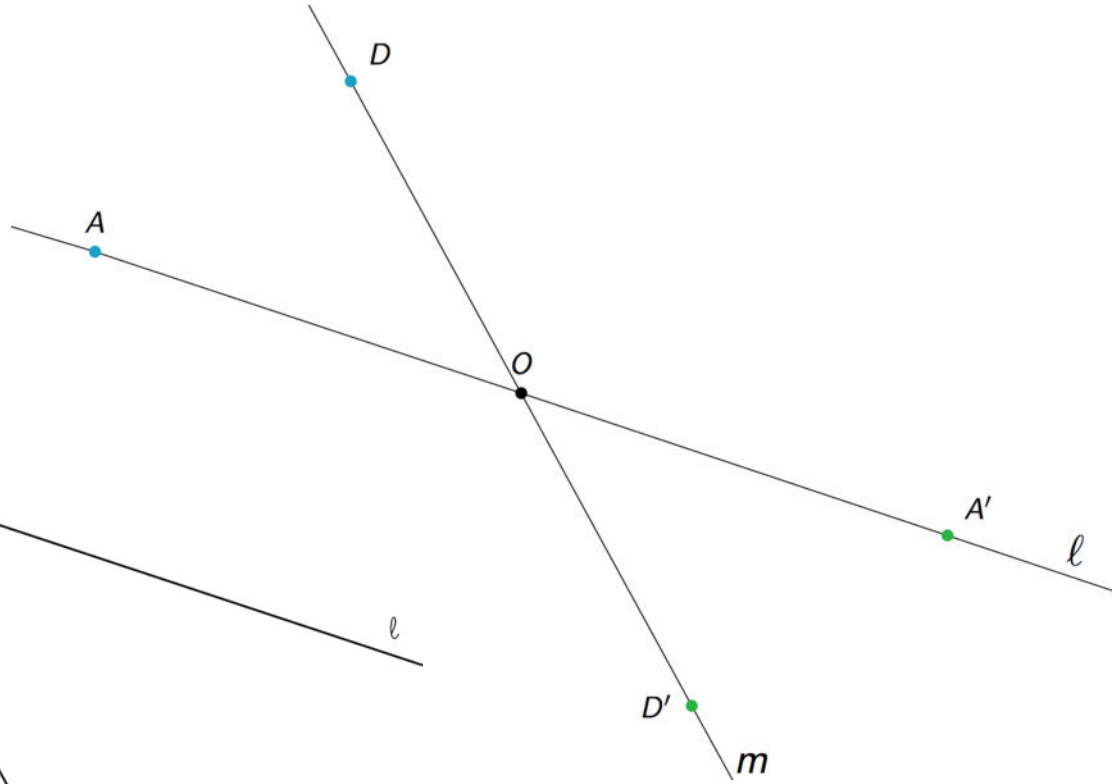


What do you know about the relationship between angle CAD and angle CA’D’?

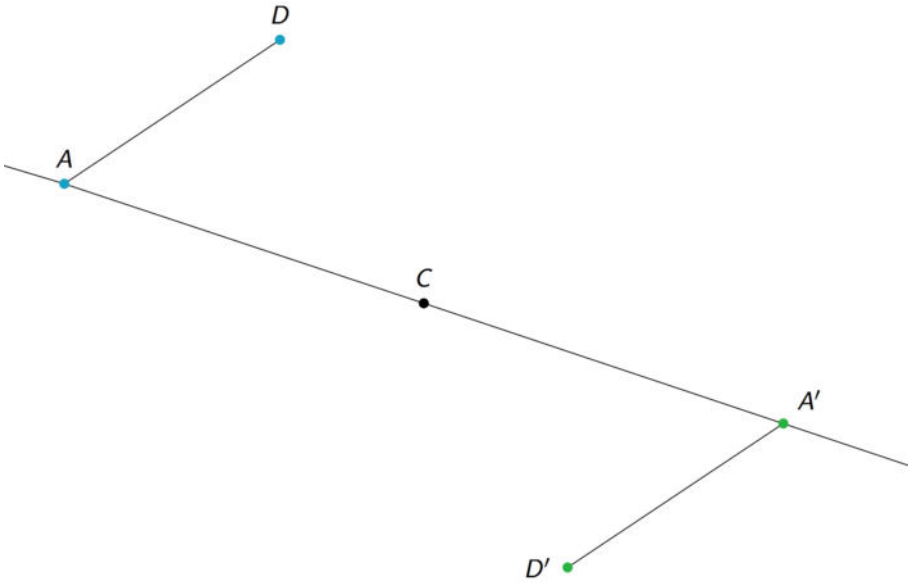


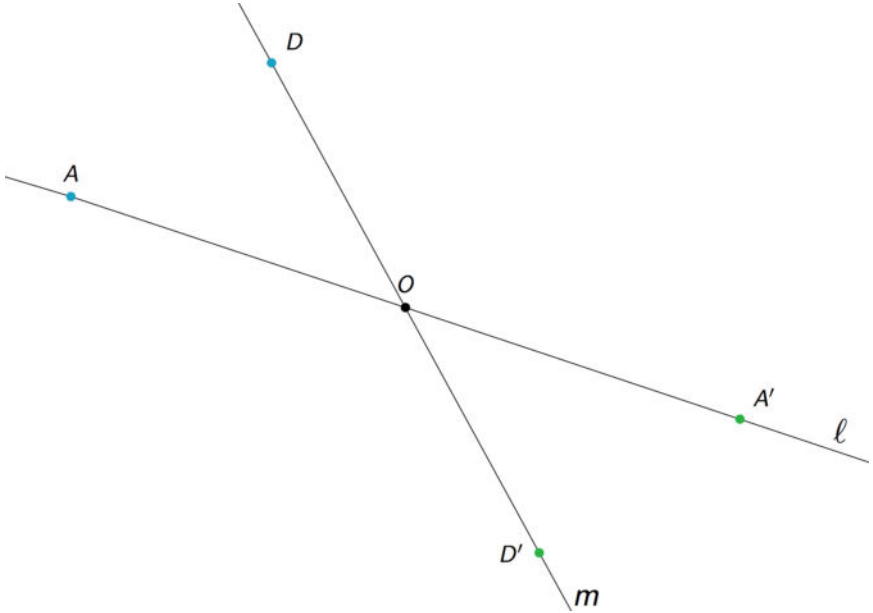
What do you know about the relationship between the angles in the figure?



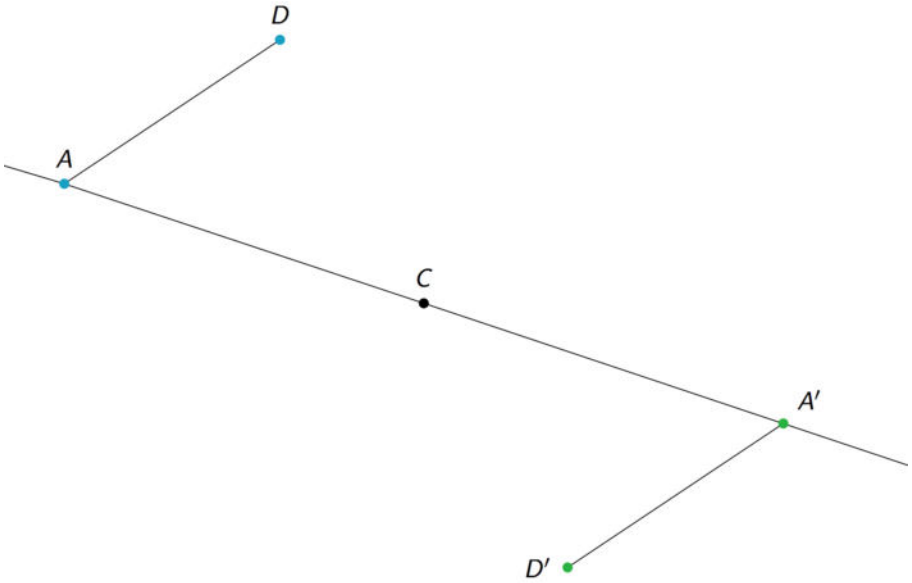


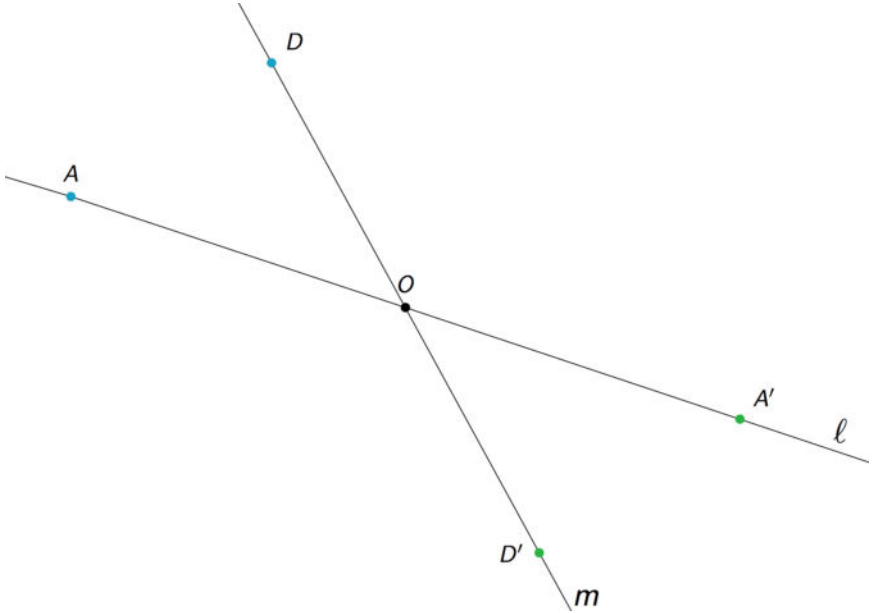
What relationships between lengths did we find after performing transformations?



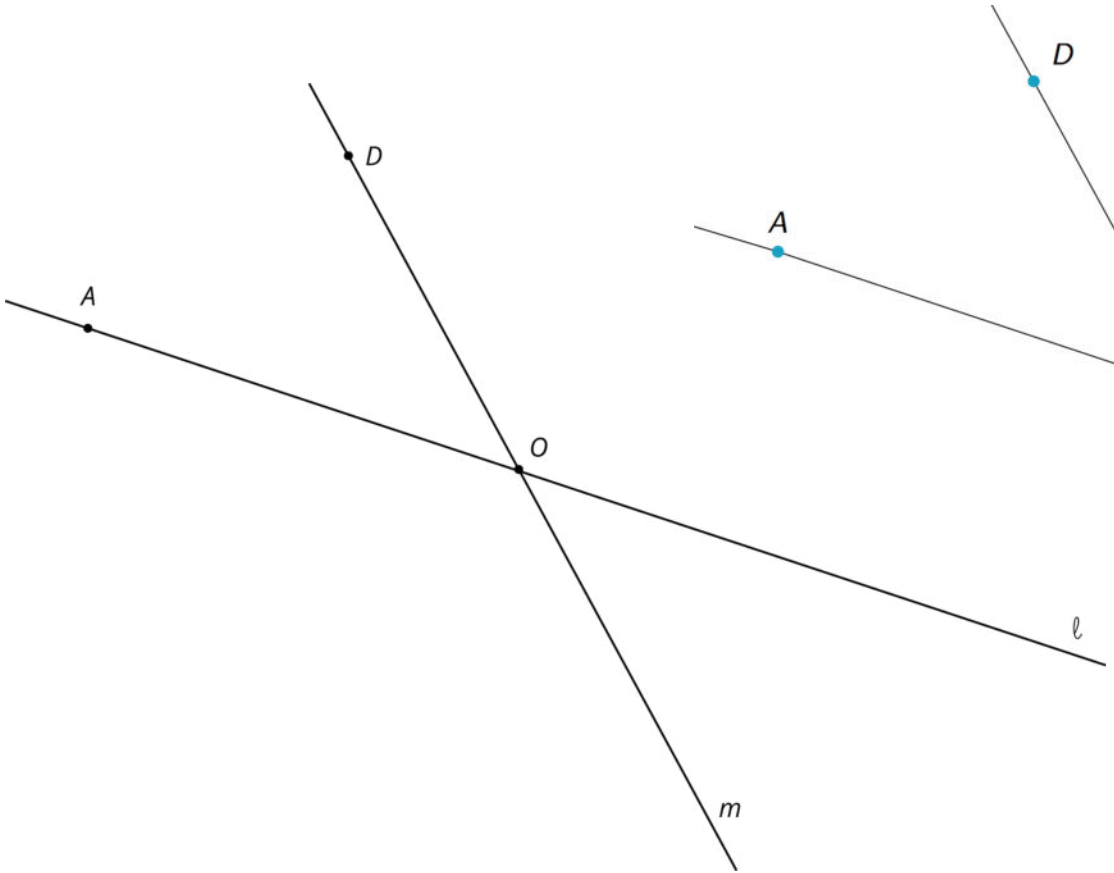


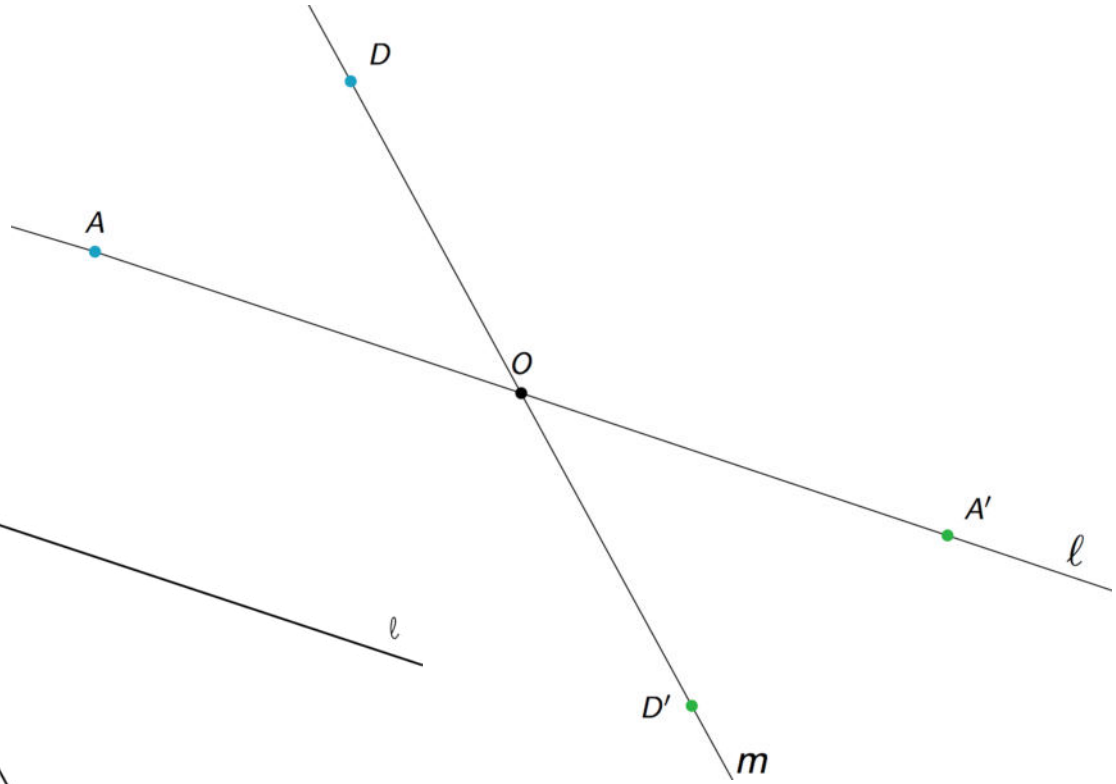
What relationships between angle measures did we find after performing transformations?





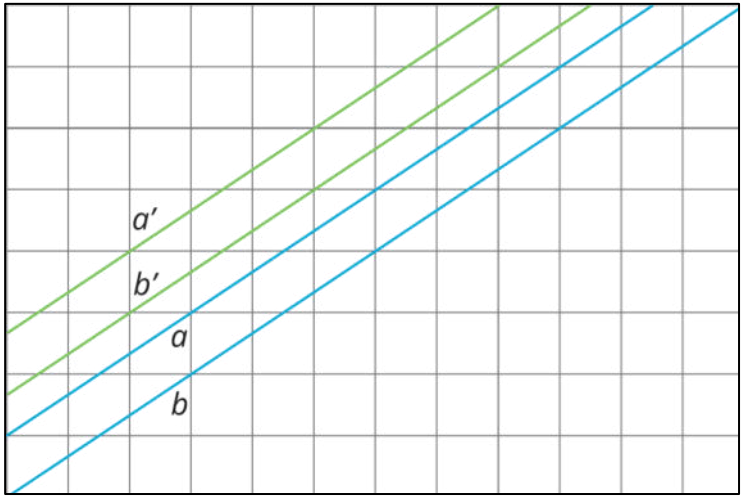
What does this transformations informally prove?

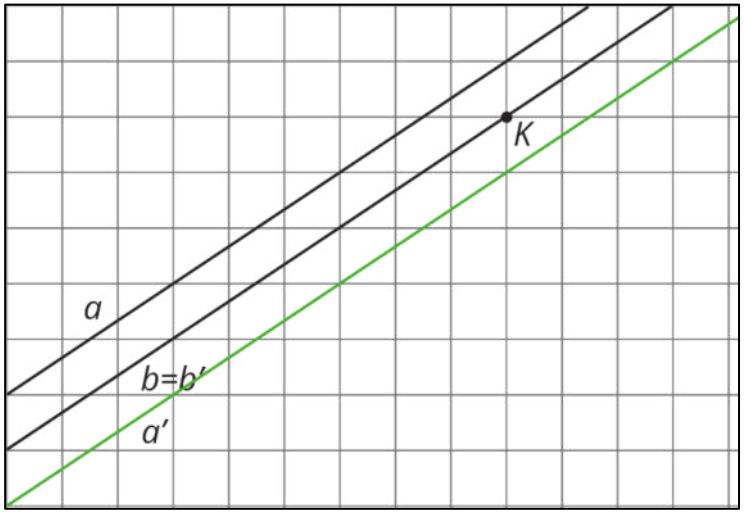




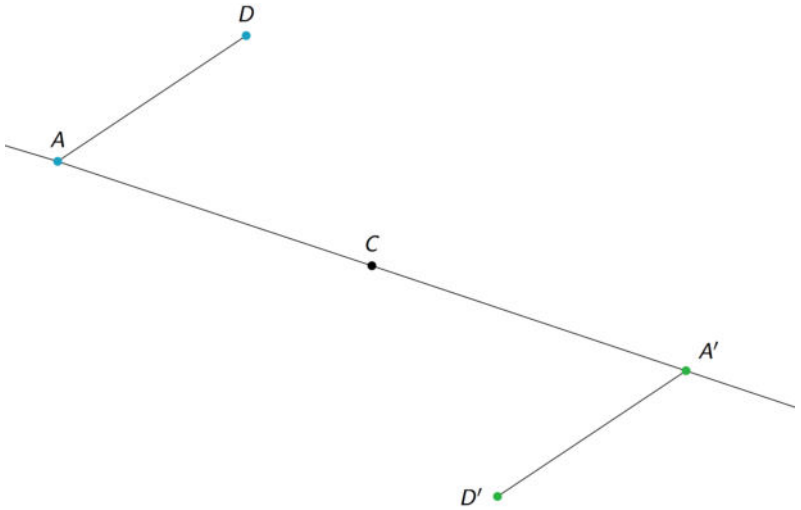
When we perform rigid transformations on parallel lines, what do we know about their image?

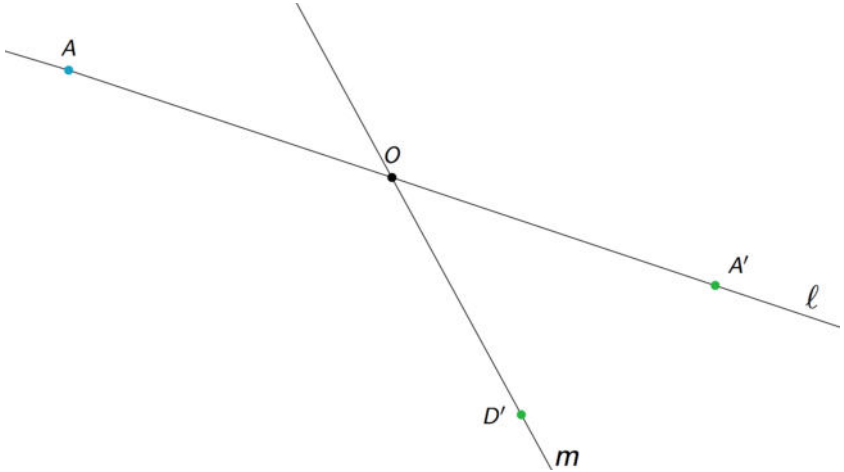
Does the distance between the lines change?





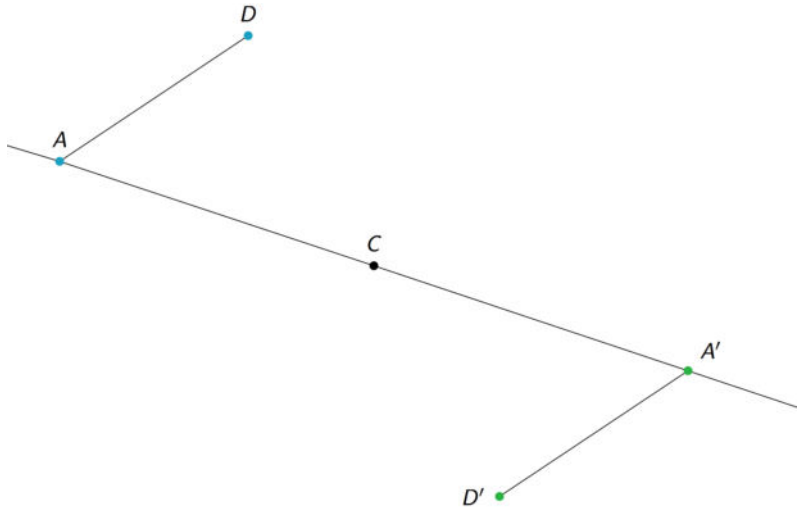
When we rotate a line 180 degrees around a point on the line, where does the line land?

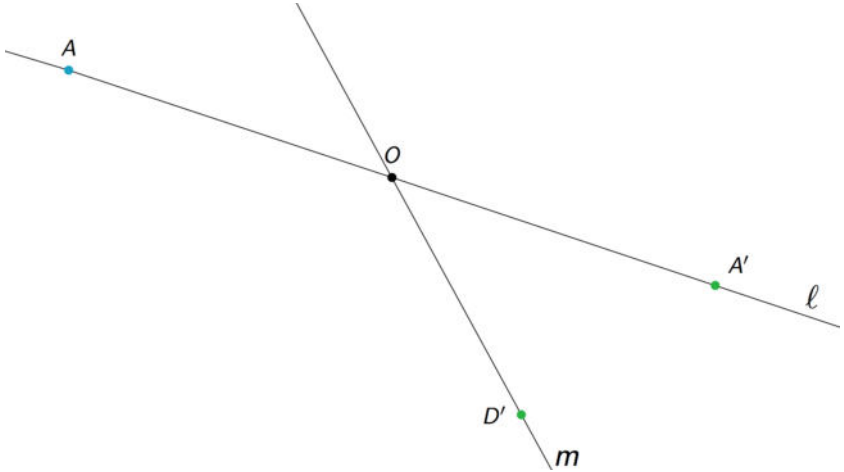




How does a rotation affect the angle measurements for a pair of intersecting lines?

How does this help up prove the vertical angle theorem?





Rigid transformations help us see that when we transform lines it might change the orientation, but the lines retain their original properties!

Today's Goals

- I can describe the effects of a rigid transformation on a pair of parallel lines.
- If I have a pair of vertical angles and know the angle measure of one of them, I can find the angle measure of the other.

Finding Missing Measurements

Cool Down 9.4