

## Lesson 3: Translating Lines

### Classwork

#### Exercises

1. Draw a line passing through point  $P$  that is parallel to line  $L$ . Draw a second line passing through point  $P$  that is parallel to line  $L$ , that is distinct (i.e., different) from the first one. What do you notice?

$P$



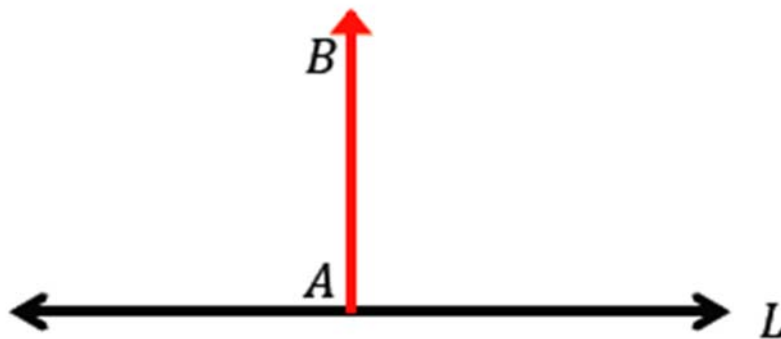
2. Translate line  $L$  along the vector  $\overline{AB}$ . What do you notice about  $L$  and its image  $L'$ ?



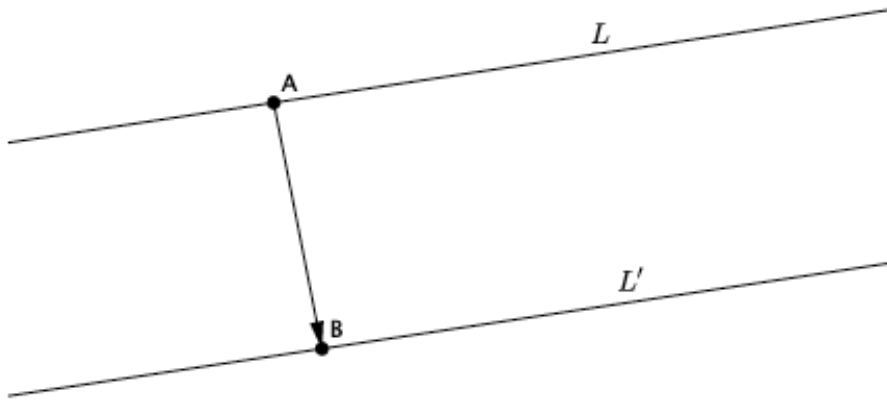
3. Line  $L$  is parallel to vector  $\overrightarrow{AB}$ . Translate line  $L$  along vector  $\overrightarrow{AB}$ . What do you notice about  $L$  and its image,  $L'$ ?



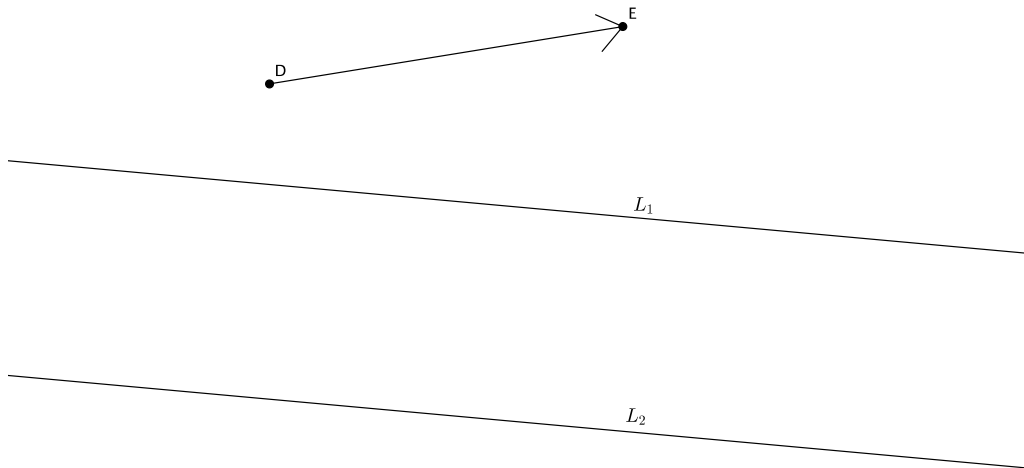
4. Translate line  $L$  along the vector  $\overrightarrow{AB}$ . What do you notice about  $L$  and its image,  $L'$ ?



5. Line  $L$  has been translated along vector  $\overrightarrow{AB}$  resulting in  $L'$ . What do you know about lines  $L$  and  $L'$ ?



6. Translate  $L_1$  and  $L_2$  along vector  $\overrightarrow{DE}$ . Label the images of the lines. If lines  $L_1$  and  $L_2$  are parallel, what do you know about their translated images?

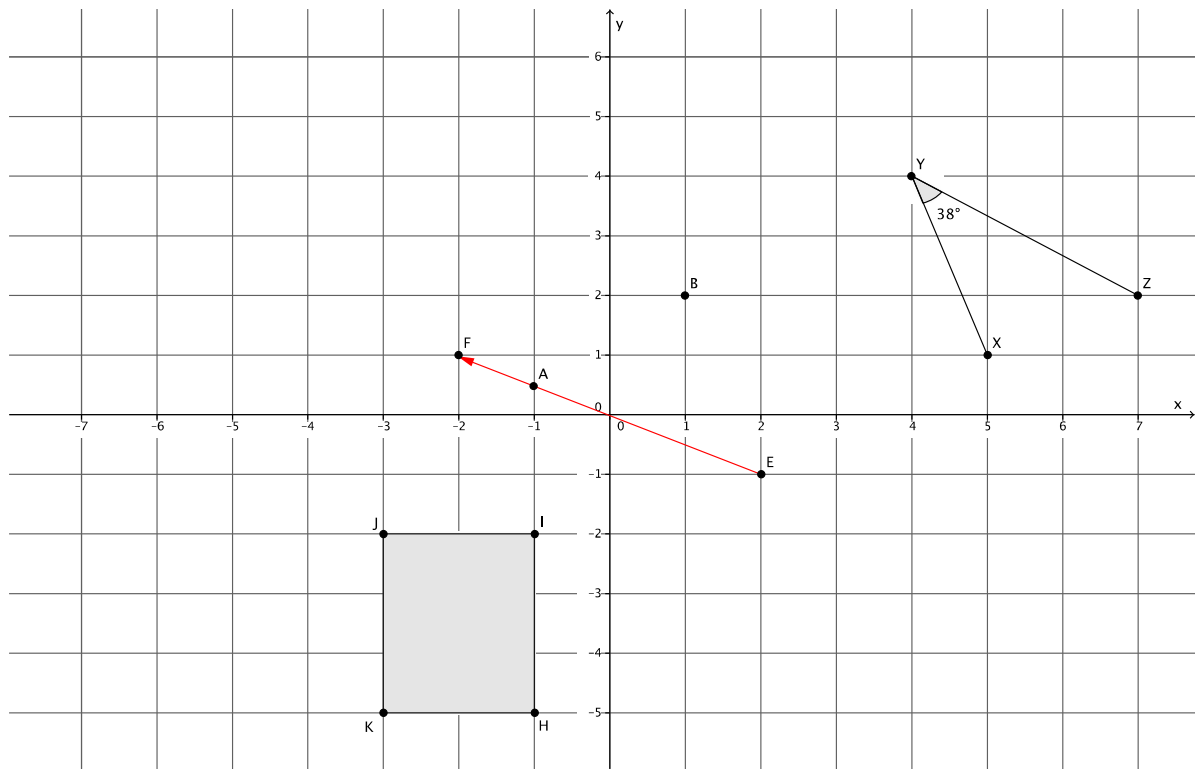


**Lesson Summary**

- Two lines are said to be parallel if they do not intersect.
- Translations map parallel lines to parallel lines.
- Given a line  $L$  and a point  $P$  not lying on  $L$ , there is at most one line passing through  $P$  and parallel to  $L$ .

**Problem Set**

1. Translate  $\angle XYZ$ , point  $A$ , point  $B$ , and rectangle  $H I J K$  along vector  $\vec{EF}$ . Sketch the images and label all points using prime notation.



2. What is the measure of the translated image of  $\angle XYZ$ . How do you know?
3. Connect  $B$  to  $B'$ . What do you know about the line formed by  $BB'$  and the line containing the vector  $\vec{EF}$ ?
4. Connect  $A$  to  $A'$ . What do you know about the line formed by  $AA'$  and the line containing the vector  $\vec{EF}$ ?
5. Given that figure  $H I J K$  is a rectangle, what do you know about lines  $HI$  and  $JK$  and their translated images? Explain.