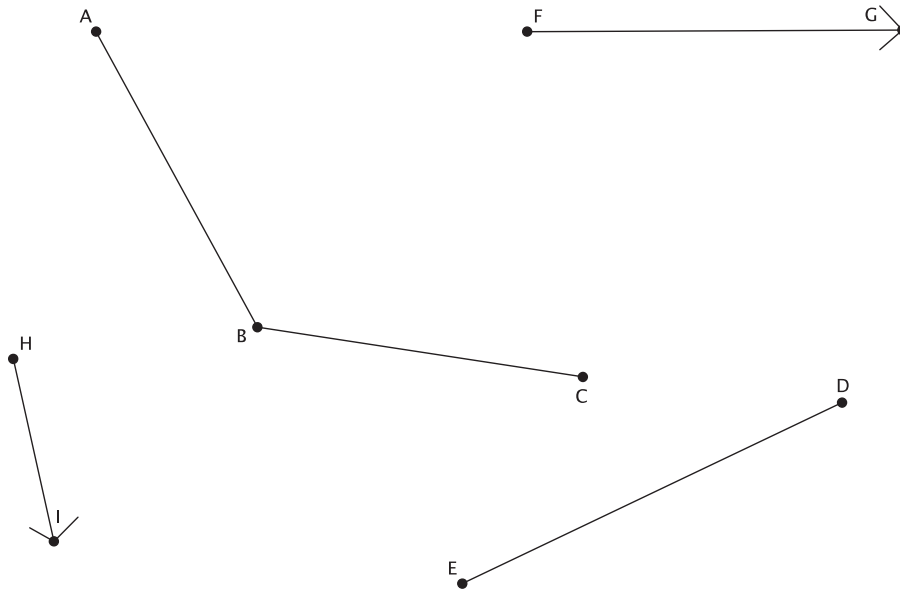


Lesson 7: Sequencing Translations

Classwork

Exploratory Challenge

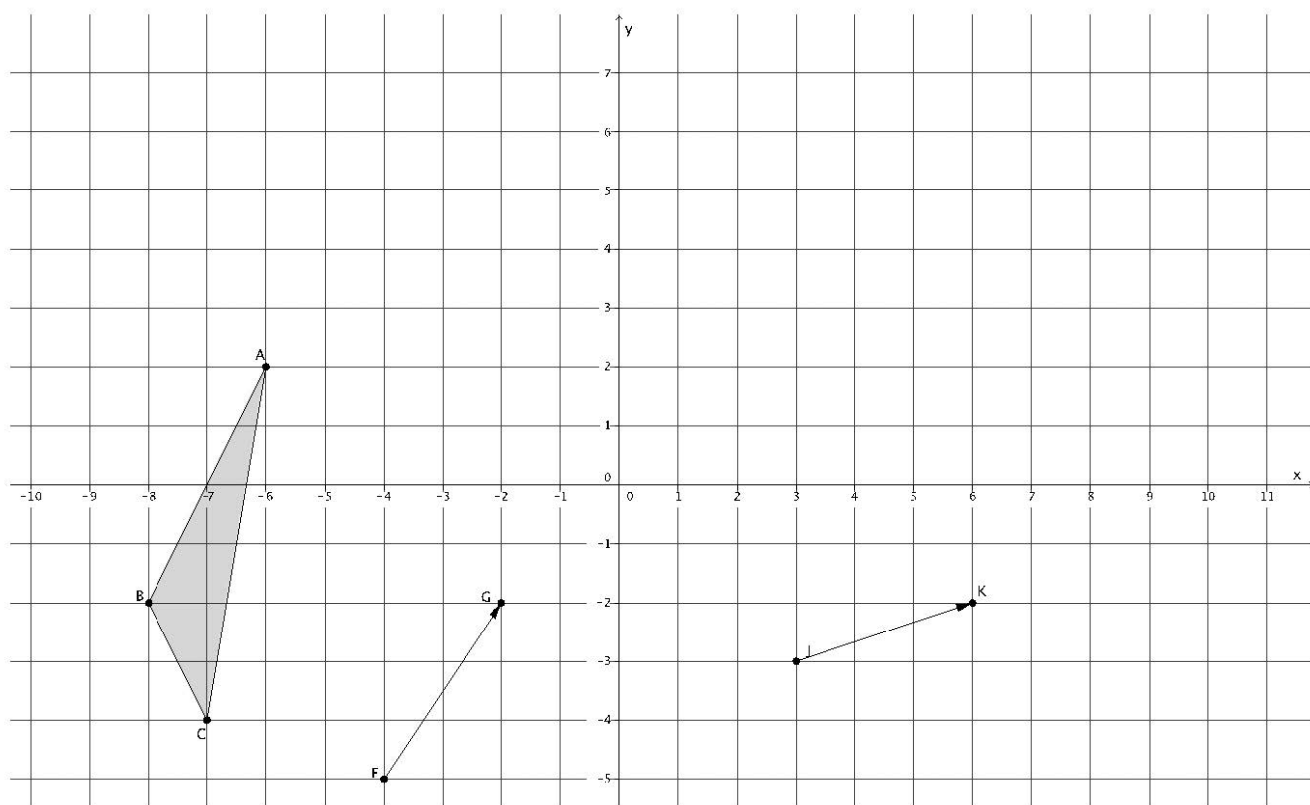
1.



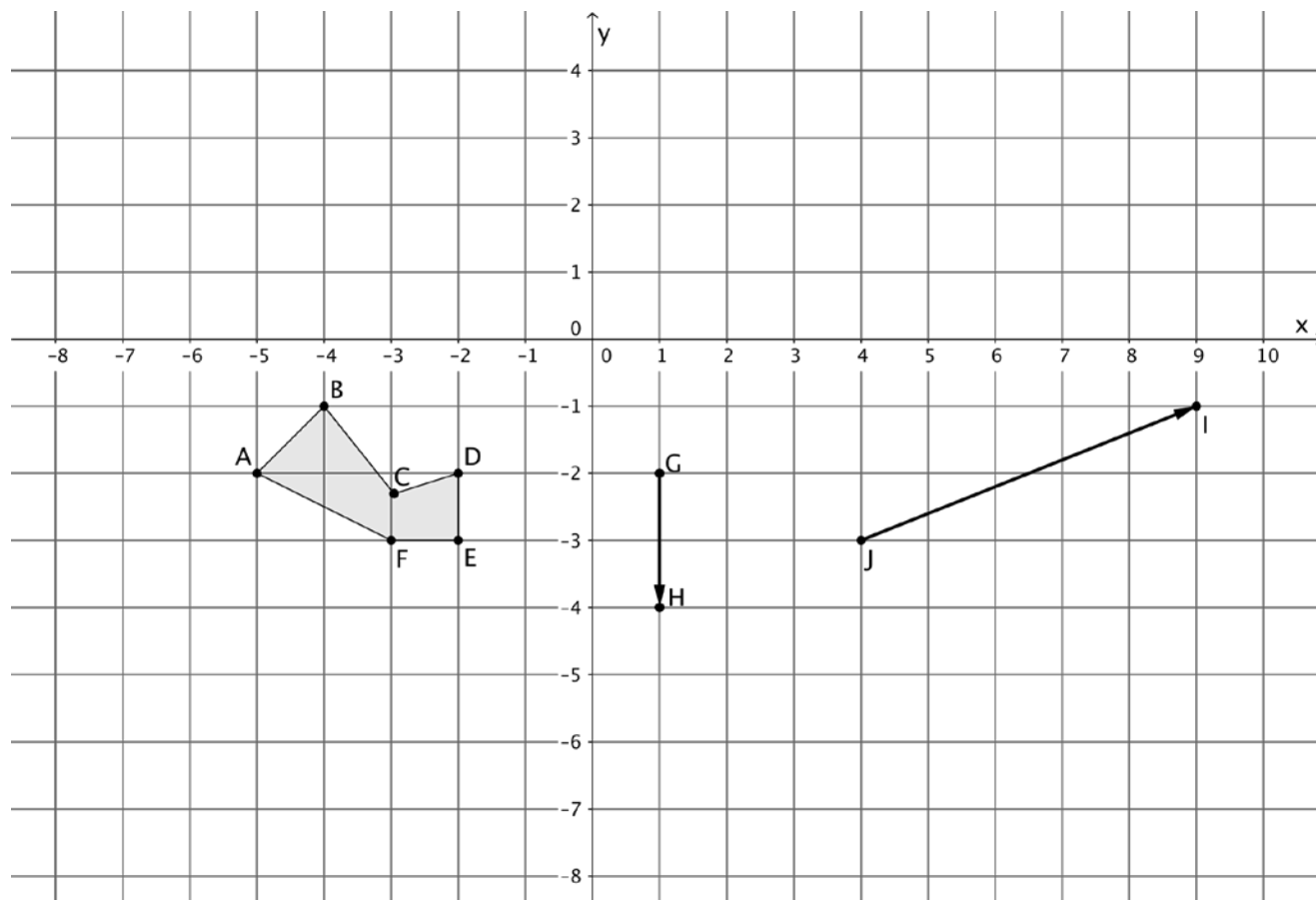
- Translate $\angle ABC$ and segment ED along vector \overrightarrow{FG} . Label the translated images appropriately, that is, $\angle A'B'C'$ and segment $E'D'$.
- Translate $\angle A'B'C'$ and segment $E'D'$ along vector \overrightarrow{HI} . Label the translated images appropriately, that is, $\angle A''B''C''$ and segment $E''D''$.
- How does the size of $\angle ABC$ compare to the size of $\angle A''B''C''$?

- d. How does the length of segment ED compare to the length of the segment $E''D''$?
- e. Why do you think what you observed in parts (d) and (e) were true?

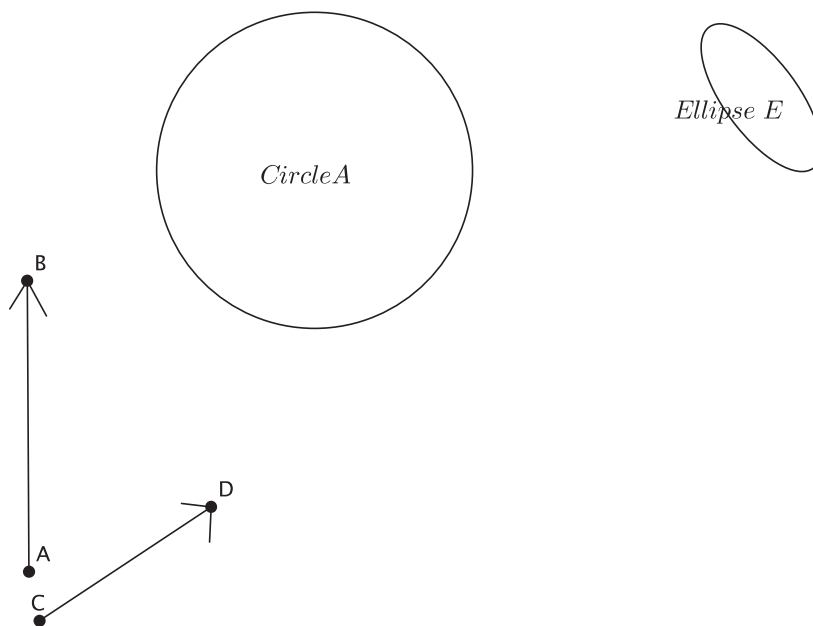
2. Translate $\triangle ABC$ along vector \overrightarrow{FG} , and then translate its image along vector \overrightarrow{JK} . Be sure to label the images appropriately.



3. Translate figure $ABCDEF$ along vector \overrightarrow{GH} . Then translate its image along vector \overrightarrow{JI} . Label each image appropriately.

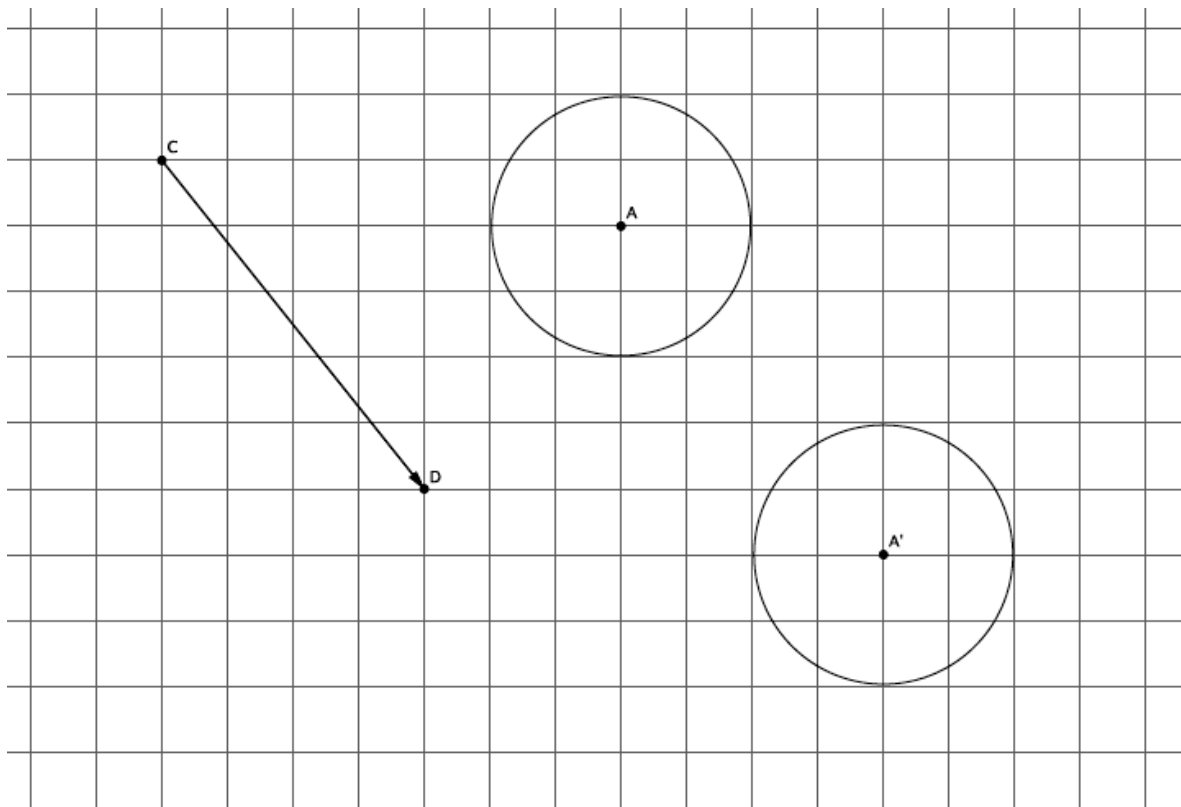


4.



- Translate Circle A and Ellipse E along vector \overrightarrow{AB} . Label the images appropriately.
- Translate Circle A' and Ellipse E' along vector \overrightarrow{CD} . Label each image appropriately.
- Did the size or shape of either figure change after performing the sequence of translations? Explain.

5. The picture below shows the translation of Circle A along vector \overrightarrow{CD} . Name the vector that maps the image of Circle A back to its original position.



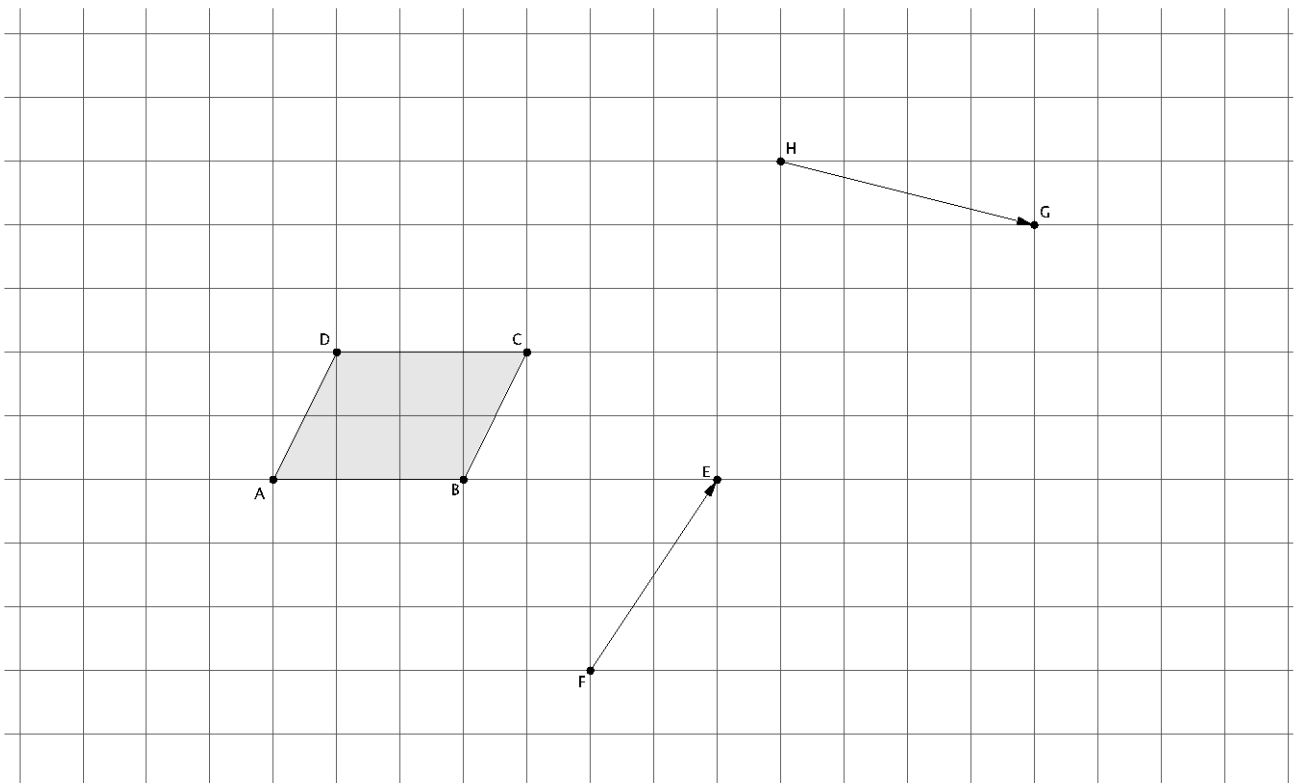
6. If a figure is translated along vector \overrightarrow{QR} , what translation takes the figure back to its original location?

Lesson Summary

- Translating a figure along one vector and then translating its image along another vector is an example of a sequence of transformations.
- A sequence of translations enjoys the same properties as a single translation. Specifically, the figures' lengths and degrees of angles are preserved.
- If a figure undergoes two transformations, F and G , and is in the same place it was originally, then the figure has been mapped onto itself.

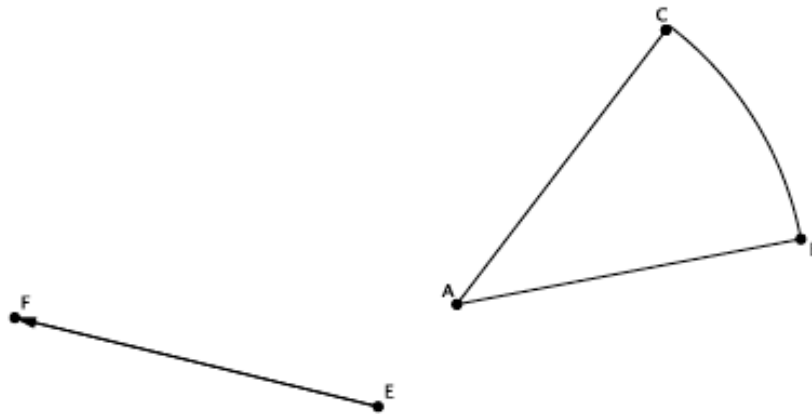
Problem Set

1. Sequence translations of parallelogram $ABCD$ (a quadrilateral in which both pairs of opposite sides are parallel) along vectors \overrightarrow{HG} and \overrightarrow{FE} . Label the translated images.



2. What do you know about \overline{AD} and \overline{BC} compared with $\overline{A'D'}$ and $\overline{B'C'}$? Explain.
3. Are the segments $A'B'$ and $A''B''$ equal in length? How do you know?

4. Translate the curved shape ABC along the given vector. Label the image.



5. What vector would map the shape $A'B'C'$ back onto shape ABC ?