Lesson 7: Sequencing Translations

Classwork
Exploratory Challenge/Exercises 1–4

1. 

   a. Translate \( \angle ABC \) and segment \( ED \) along vector \( \overrightarrow{FG} \). Label the translated images appropriately, that is, \( \angle A'B'C' \) and segment \( E'D' \).

   b. Translate \( \angle A'B'C' \) and segment \( E'D' \) along vector \( \overrightarrow{HH} \). Label the translated images appropriately, that is, \( \angle A''B''C'' \) and segment \( E''D'' \).

   c. 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 $\overrightarrow{IJ}$. Label each image appropriately.
4.

a. Translate Circle $A$ and Ellipse $E$ along vector $\overrightarrow{AB}$. Label the images appropriately.

b. Translate Circle $A'$ and Ellipse $E'$ along vector $\overrightarrow{CD}$. Label each image appropriately.

c. 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?