Glide Reflections
Student Activity

Name _____

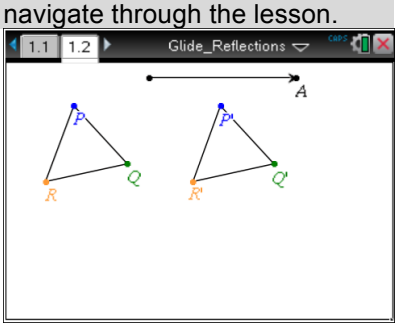
Class _____

Open or create the TI-Nspire document ***Glide_Reflections.tns.***

In this activity, you will reflect a translated image to study the composition of isometric transformations.

Move to page 1.2.

Press ctrl ▶ and ctrl ◀ to navigate through the lesson.



Part 1 – Exploring a translated triangle

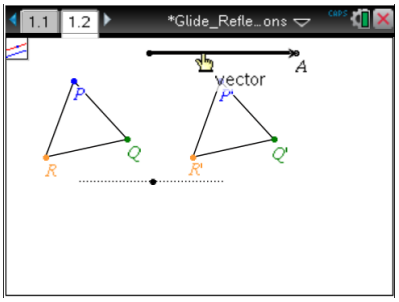
On page 1.2, ΔPQR maps onto $\Delta P'Q'R'$ using a translation determined by the vector at the top of the screen.

A **translation** is an example of an *isometry* since a translation produces an image that is congruent to the pre-image.

1. $\Delta PQR \cong$ _____

2. Grab and drag point *A* to change the magnitude and direction of the vector. Describe the changes that occur in image $\Delta P'Q'R'$ as you change the vector.

Next, you will make a line parallel to the vector through a point somewhere in the plane.



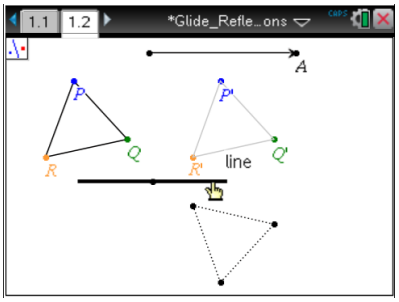
Step 1: Press **Menu > Construction > Parallel**.

Step 2: Move to a location below the triangles and press ⬚ to mark a point.

Step 3: Move the cursor near the vector until you see ☝ and the word *vector.* Press ⬚.

Step 4: Press esc to exit the **Parallel** tool.

To reflect $\Delta P'Q'R'$ over the line, do the following:



Step 1: Press **Menu > Transformation > Reflection**.

Step 2: Move toward the translated triangle $P'Q'R'$. Press ⬚ to select this triangle.

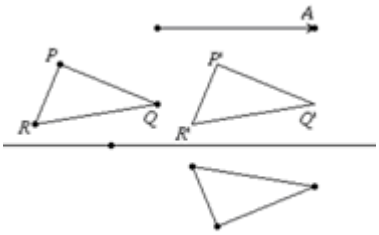
Step 3: Move the cursor to the line and press ⬚.

Step 4: Press esc to exit the **Reflection** tool.

3. Is the new image congruent to $\Delta P'Q'R'$? How do you know?

4. Is the reflected image congruent to the original triangle, ΔPQR? How do you know?

5. Using P'', Q'', and R'', write the label for each vertex of the reflected triangle in the figure at the right.



6. An isometry is a transformation that produces an image that is congruent to the pre-image. What two isometric transformations were used in this activity?

- When two or more transformations are performed in sequence to produce a single transformation, the result is called a *composition* of the transformations.
- One example of a composite transformation is a **glide reflection**. A **glide reflection** is a transformation in which every point P is mapped onto a point P'' by the following steps:
  1. A translation maps P onto P'.
  2. A reflection over a line parallel to the direction of the translation maps P' onto P''.

7. Is a glide reflection an isometry? How do you know?