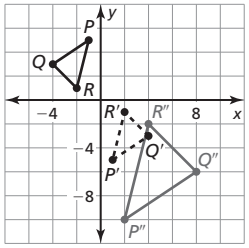
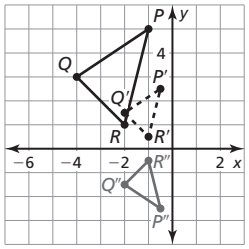
4.6 Practice A

1.



2.



3. reflection in the y-axis, followed by a dilation with a scale factor of 2

4. yes; The triangle is a translation; $(x, y) \rightarrow (x + 5, y - 1)$ followed by a dilation of $(x, y) \rightarrow \left(\frac{2}{3}x, \frac{2}{3}y\right)$; Points C and F do not follow these transformations, so it is not a similarity transformation.

5. yes; The quadrilateral can first be rotated $180°$ about the origin (or, reflected in the y-axis and then the x-axis). Then the figure can be dilated with a scale factor of $k = 0.5$ and translated to its final position.

6. Rotate ΔPQR so that side a is parallel to side b. Translate ΔGHI so that point G maps to point P. Because translations preserve angle measure, and all of the angles of an equilateral triangle are $60°$, ΔGHI lies on ΔPQR. Because, $\overrightarrow{GI}$ coincides with $\overrightarrow{PR}$ and $\overrightarrow{GH}$ coincides with $\overrightarrow{PQ}$, $\overline{GI}$ lies on $\overline{PR}$ and $\overline{GH}$ lies on $\overline{PQ}$. Finally, dilate ΔPQR about point P by a scale factor of $\frac{b}{a}$ so that it is the same size as ΔGHI. Because a similarity transformation maps ΔPQR onto ΔGHI, the triangles are similar.

7. no; A square and a rectangle are not similar, so you cannot use a similarity transformation to change the shape of the object.

8. no; For example begin with a unit square centered at the origin. If you perform a dilation centered at the origin with a scale factor 2 and then translate 1 unit right, the result is not the same as if you first translate the square 1 unit right and then perform a dilation centered at the origin with a scale factor of 2.

9. All white triangles are dilations and translations. There are no rotations in the image.