

Create A Mystery Picture with Rotation, Reflection, and Translation

The Idea: We are going to use geometric transformations to jumble up 7 pieces of a tangram puzzle, and we are going to use what we know about the coordinate plane, ordered pairs, rotation, reflection, and translation in order to return the pieces back to their position to reveal the original image.

Requirements:

Label both of your graph papers NEATLY and IDENTICALLY with a point of origin, x and y axis markers, number line labels (ex. -2, -1, 0, 1, 2, 3, etc.)

You must use the following shapes to design a picture (tangram shapes):

- 2 small triangles
- 2 large triangles
- 1 medium triangle
- 1 quadrilateral
- 1 square

On the first piece of graph paper, draw your original picture using the 7 tangram shapes. Find the ordered pair of each point of the shape, and list it on your notebook paper beneath a header labeled An Original Mystery by (Your name). Separate points of the same shape with commas between ordered pairs, and move to the next line of the paper for each separate shape.

On the second piece of graph paper, move each of your shapes using a variety of transformations (at least 2 rotations, reflections, and translations). Find the ordered pair for each point of each shape at its new location, and list it on your notebook paper beneath a header labeled An Original Mystery by (Your Name) Transformed. Next to each set of points, identify how you would transform your shape from its new location to return it to its original position. Be sure to use your math vocabulary.

Examples of proper labeling:

Rotations: Rotated 90° clockwise around point of origin; Rotated 180° counter-clockwise around point (2, 2).

Translations: Translated Up 4, Right 7; Translated +7 on the x axis, and -3 on the y axis.

Reflections: Reflected on the y axis; reflected over the (0, 3) horizontal line of reflection

You will be checking your work with a partner who will try to follow your instructions to discover your original design. If you'd like an opportunity to be creative, you may add a riddle to your puzzle that can be by properly solving your puzzle.

