

Exploring Rotations and Translations

Class Starter: Yesterday, you explored reflections across the lines $y = a$ and $x = b$. Explore how the reflection #1 and reflection #2 show the relationship represented by $2a$ in your rules. Explain what you find.

Pairs Activity: Partner A will record answers for question one in this document. Partner B will explore on the [GeoGebra Activity](#). Partners will switch roles after each question.

1. Record 3 points from the original figure in the GeoGebra Activity.

Point Name	x	y

2. Rotate the figure about the origin 90° clockwise. Record the corresponding 3 points from the image in the table below.

Point Name'	x	y

3. Rotate the figure about the origin 180° clockwise. Record the corresponding 3 points from the image in the table below.

Point Name'	x	y

4. Rotate the figure about the origin 270° clockwise. Record the corresponding 3 points from the image in the table below.

Point Name'	x	y

Write the rule as (x, y) changes

$(x, y) \rightarrow$

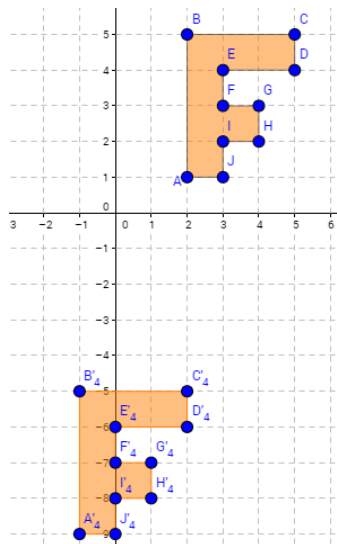
$(x, y) \rightarrow$

$(x, y) \rightarrow$

5. What happens if you rotate the original figure 90° counterclockwise? Explain.

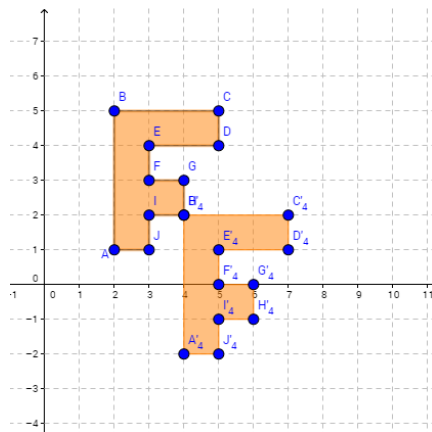
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6. Translate the figure to look like the picture below. Write the rule.



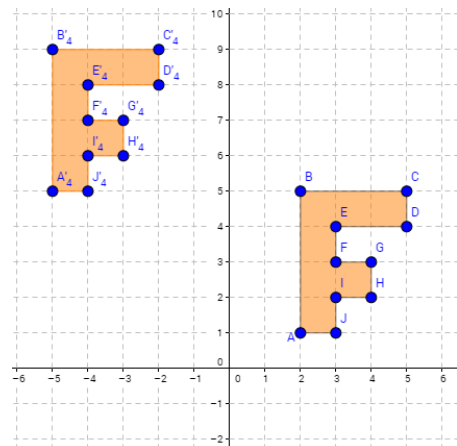
$(x, y) \rightarrow$

7. Translate the figure to look like the picture below. Write the rule.



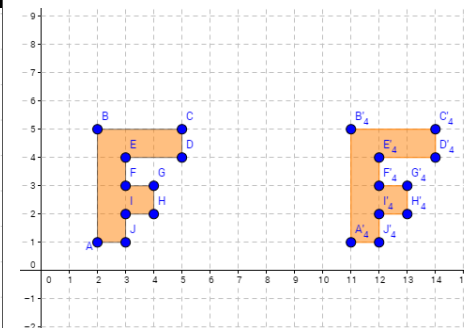
$(x, y) \rightarrow$

8. Translate the figure to look like the picture below. Write the rule.

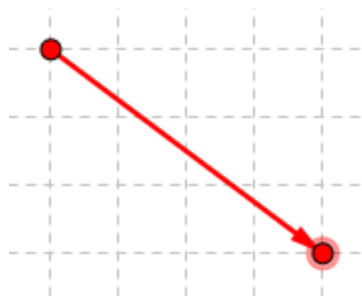


$(x, y) \rightarrow$

9. Translate the figure to look like the picture below. Write the rule.



$(x, y) \rightarrow$



10. The tool for translations used in GeoGebra is on the left. Write a rule based on just the tool.

$(x, y) \rightarrow$

Explain how you knew the rule below.

11. The tool on the left represents a **vector**. Translations moving both horizontally and vertically at the same time move along that line.

If the vector notation for translating the figure is $\langle 2, -3 \rangle$, where 2 represents the horizontal shift and 3 represents the vertical, how could you write that as a rule?

$(x, y) \rightarrow$

12. From the list of possible transformations on GeoGebra, which one does NOT produce congruent figures. Justify your answer.