LESSON MAKER PRO

# Move It, Match It

*Use transformations to map figures exactly.*

**HIGH SCHOOL · MA.912.GR.2.3**

**MA.912.GR.2.3** "Identify a sequence of transformations that will map a given figure onto itself or onto another congruent or similar figure."

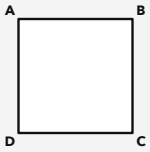
NAME _____ DATE _____

## BUILD A MOVE SEQUENCE

A rigid motion preserves size and shape. A dilation changes size by a scale factor, so it can map similar figures. List moves in order, because changing the order can change the result.

## WORKED EXAMPLE

The square icon shown is turned 90° clockwise about its center, then moved to a matching location. Write the sequence if the move is 6 units right.




1. Rotate the square 90° clockwise about its center.
2. The rotated square still covers the original square.
3. Translate the result 6 units right.

**Answer: Rotate 90° clockwise about the center, then translate 6 units right.**

## PRACTICE 4 problems

**1** Triangle A(0,0), B(2,0), C(0,1) maps to A'(3,2), B'(5,2), C'(3,3). Name the transformation.

**ANSWER** _____

**2** Rectangle A(1,1), B(3,1), C(3,2), D(1,2) maps to A'(2,4), B'(0,4), C'(0,5), D'(2,5). Use a reflection over the y-axis first. Name the full sequence.

**ANSWER** _____

**3** Triangle A(1,1), B(1,2), C(2,1) maps to A'(4,4), B'(4,8), C'(8,4). Name the transformation.

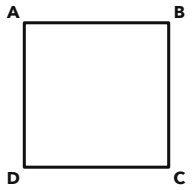
**ANSWER** _____

**4** A non-square rectangle is centered at the origin. Name a rotation that maps it onto itself.

**ANSWER** _____

## APPLY IT Show your work

**1** An album app uses the square icon shown. A designer makes a matching icon by making a half-turn about the icon's center, then placing it 4 units lower. What sequence maps the original icon to the new icon?




**ANSWER** _____

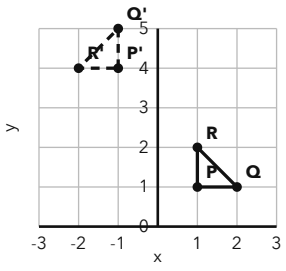
**2** In a game level, a triangular zone has vertices (1,2), (2,2), and (1,4). Its new vertices are (1,3), (1,4), and (-1,3). The zone is first rotated 270° clockwise about the origin. What translation completes the mapping?

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

Use the solid and dashed triangles shown. Describe a sequence that maps triangle PQR onto triangle P'Q'R'. Explain why the moves must be in this order.




WORK SPACE AND ANSWER

**ANSWER KEY** # Move It, Match It

**HIGH SCHOOL · MA.912.GR.2.3**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Triangle A(0,0), B(2,0), C(0,1) maps to A'(3,2), B'(5,2), C'(3,3). Name the transformation. | **Translate 3 units right and 2 units up.** |
| 2 | Rectangle A(1,1), B(3,1), C(3,2), D(1,2) maps to A'(2,4), B'(0,4), C'(0,5), D'(2,5). Use a reflection over the y-axis first. Name the full sequence. | **Reflect over the y-axis, then translate 3 units right and 3 units up.** |
| 3 | Triangle A(1,1), B(1,2), C(2,1) maps to A'(4,4), B'(4,8), C'(8,4). Name the transformation. | **Dilate about the origin with scale factor 4.** |
| 4 | A non-square rectangle is centered at the origin. Name a rotation that maps it onto itself. | **Rotate 180° about the origin.** |

## PART 2 · APPLY IT

1. **Rotate 180° about the center, then translate 4 units down.** A half-turn maps the square onto itself. The second move changes its location 4 units downward.
2. **Translate 3 units right and 2 units up.** After the rotation, the vertices are (-2,1), (-2,2), and (-4,1). Adding 3 to each x-coordinate and 2 to each y-coordinate gives the new vertices.

## CHALLENGE

**Rotate 270° clockwise about the origin, then translate 3 units up. The rotation sends P to (-1,1), and the translation sends it to P'(-1,4); translating first would rotate the shift and miss P'.**

Accept equivalent direction language, such as a counterclockwise quarter-turn for the 270° clockwise rotation. For sequences, require the stated order and an equivalent translation description.