LESSON MAKER PRO

Transformation Detectives

Read coordinate changes and write rules.

HIGH SCHOOL · MA.912.GR.2.1

MA.912.GR.2.1 "Given a preimage and image, describe the transformation and represent the transformation algebraically using coordinates."

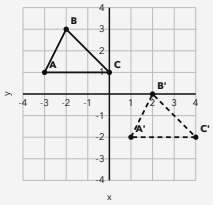
NAME _____ DATE _____

TRACK BOTH COORDINATES

Match each preimage point to its image point. Look for a repeated coordinate change, a sign change, or a swap of x and y. Then write one rule that maps every point.

WORKED EXAMPLE

The solid triangle maps to the dashed triangle. Describe the transformation and write its rule.



1. A moves 4 right and 3 down.
2. B and C make the same move.
3. Add 4 to x and subtract 3 from y.

Answer: Translation 4 units right and 3 units down: (x, y) -> (x + 4, y - 3).

PRACTICE 4 problems

1 P(9, -7) maps to P'(-5, 11), and Q(13, 6) maps to Q'(-1, 24). Describe the transformation and write the rule.

ANSWER _____

2 D(5, 6), E(8, 10), and F(12, 7) map to D'(5, -6), E'(8, -10), and F'(12, -7). Describe the transformation and write the rule.

ANSWER _____

3 K(9, -8), L(6, 11), and M(-7, 10) map to K'(8, 9), L'(-11, 6), and M'(-10, -7). Describe the transformation and write the rule.

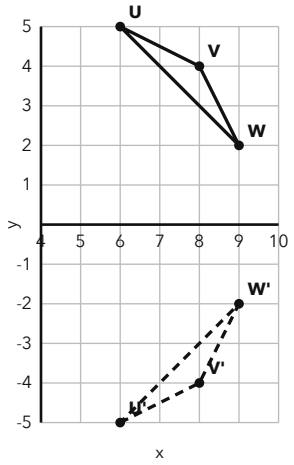
ANSWER _____

4 R(7, -5) maps to R'(35, -25), and S(-10, 6) maps to S'(-50, 30). Describe the transformation and write the rule.

ANSWER _____

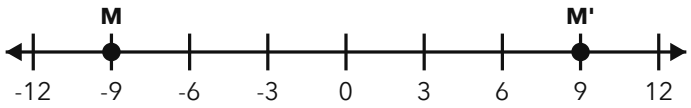
APPLY IT Show your work

1 A game design club flips the solid half of a badge to make the dashed half. Use the graph to describe the transformation and write its rule.



ANSWER _____

2 A designer reflects a music-festival logo across the y-axis. The number line shows the x-coordinate of point M before and after the reflection. Write the full coordinate rule.



ANSWER _____

CHALLENGE One step up

A(6, 9), B(8, 6), and C(10, 11) map to A'(9, 23), B'(7, 20), and C'(5, 25). Write one rule. Then describe the two transformations in order.

WORK SPACE AND ANSWER

ANSWER KEY

Transformation Detectives

HIGH SCHOOL · MA.912.GR.2.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	P(9, -7) maps to P'(-5, 11), and Q(13, 6) maps to Q'(-1, 24). Describe the transformation and write the rule.	**Translation 14 units left and 18 units up: (x, y) -> (x - 14, y + 18).**
2	D(5, 6), E(8, 10), and F(12, 7) map to D'(5, -6), E'(8, -10), and F'(12, -7). Describe the transformation and write the rule.	**Reflection across the x-axis: (x, y) -> (x, -y).**
3	K(9, -8), L(6, 11), and M(-7, 10) map to K'(8, 9), L'(-11, 6), and M'(-10, -7). Describe the transformation and write the rule.	**90° counterclockwise rotation about the origin: (x, y) -> (-y, x).**
4	R(7, -5) maps to R'(35, -25), and S(-10, 6) maps to S'(-50, 30). Describe the transformation and write the rule.	**Dilation centered at the origin with scale factor 5: (x, y) -> (5x, 5y).**

PART 2 · APPLY IT

1. **Reflection across the x-axis: (x, y) -> (x, -y).** The x-coordinate stays the same for each matching point. Each y-coordinate changes to its opposite.
2. **Reflection across the y-axis: (x, y) -> (-x, y).** A reflection across the y-axis changes the sign of x. The y-coordinate stays unchanged.

CHALLENGE

Rule: (x, y) -> (-x + 15, y + 14). Reflect across the y-axis, then translate 15 units right and 14 units up.

Accept equivalent coordinate-rule notation. For the challenge, accept the equivalent description of reflecting across x = 15/2 and then translating 14 units up.