

Transformation Detectives

Use coordinate clues to name each move.

GRADE 8 • MA.8.GR.2.1

MA.8.GR.2.1 "Given a preimage and image generated by a single transformation, identify the transformation that describes the relationship."

NAME _____

DATE _____

SPOT THE MOVE

Compare matching points in the preimage and image. If every point moves the same horizontal and vertical amount, it is a translation. A flip across a line is a reflection, a turn about a center is a rotation, and a size change from a center is a dilation.

WORKED EXAMPLE

Points J(20,16) and K(25,12) map to J'(29,25) and K'(34,21). Identify the transformation.

1. J moves $29 - 20 = 9$ units right and $25 - 16 = 9$ units up.
2. K moves $34 - 25 = 9$ units right and $21 - 12 = 9$ units up.
3. Both points make the same move.

Answer: Translation 9 units right and 9 units up.

PRACTICE 6 problems

- 1** 1. Triangle ABC has A(2,7), B(6,5), and C(3,1). Its image has A'(7,3), B'(11,1), and C'(8,-3). Identify the transformation.

ANSWER _____

- 2** 2. Points P(-4,8) and Q(-1,3) map to P'(4,8) and Q'(1,3). Identify the transformation.

ANSWER _____

- 3** 3. Points R(5,-2) and S(1,-6) map to R'(-2,-5) and S'(-6,-1). Identify the transformation.

ANSWER _____

- 4** 4. Points U(3,-4) and V(1,5) map to U'(6,-8) and V'(2,10). Identify the transformation.

ANSWER _____

- 5** 5. Points E(3,8) and F(7,4) map to E'(3,-8) and F'(7,-4). Identify the transformation.

ANSWER _____

- 6** 6. Points G(-7,2) and H(-3,-4) map to G'(7,-2) and H'(3,4). Identify the transformation.

ANSWER _____

APPLY IT Show your work

- 1** Apply 1. On a coordinate game map, a player badge has vertices $A(-2,4)$, $B(1,6)$, and $C(3,2)$. After one transformation, the badge has vertices $A'(-2,-4)$, $B'(1,-6)$, and $C'(3,-2)$. What transformation was used?

WORK SPACE

ANSWER _____

- 2** Apply 2. For a school club's social media post, a student turns a music-note icon on a coordinate grid. Points $M(4,-1)$ and $N(2,3)$ move to $M'(1,4)$ and $N'(-3,2)$. What transformation was used?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Challenge. Triangle ABC has $A(2,7)$, $B(6,3)$, and $C(4,9)$. Its image has $A'(10,1)$, $B'(6,5)$, and $C'(8,-1)$. Identify the transformation and explain how the point $(6,4)$ helps prove your answer.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	1. Triangle ABC has A(2,7), B(6,5), and C(3,1). Its image has A'(7,3), B'(11,1), and C'(8,-3). Identify the transformation.	Translation 5 units right and 4 units down.
2	2. Points P(-4,8) and Q(-1,3) map to P'(4,8) and Q'(1,3). Identify the transformation.	Reflection across the y-axis.
3	3. Points R(5,-2) and S(1,-6) map to R'(-2,-5) and S'(-6,-1). Identify the transformation.	Rotation 90 degrees clockwise about the origin.
4	4. Points U(3,-4) and V(1,5) map to U'(6,-8) and V'(2,10). Identify the transformation.	Dilation centered at the origin with scale factor 2.
5	5. Points E(3,8) and F(7,4) map to E'(3,-8) and F'(7,-4). Identify the transformation.	Reflection across the x-axis.
6	6. Points G(-7,2) and H(-3,-4) map to G'(7,-2) and H'(3,4). Identify the transformation.	Rotation 180 degrees about the origin.

PART 2 • APPLY IT

- Reflection across the x-axis.** Each x-coordinate stays the same, while each y-coordinate changes to its opposite. This is a reflection across the x-axis.
- Rotation 90 degrees counterclockwise about the origin.** A 90 degree counterclockwise rotation maps (x,y) to (-y,x). Both pairs follow this rule.

CHALLENGE

A 180 degree rotation about (6,4). The midpoint of each matching pair, A and A', B and B', and C and C', is (6,4), so that point is the center of the half-turn.

Accept equivalent direction wording for translations, such as "right 5, down 4," and "clockwise 90 degrees" for rotations. For the challenge, accept any correct explanation that shows (6,4) is the midpoint of every preimage-image pair.