

Motion Match

Show how one figure moves to match another.

GRADE 8 • 8.G.A.2

CCSS.Math.Content.8.G.A.2 "Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures..."

NAME _____

DATE _____

CONGRUENT MOVES

Congruent figures have the same size and shape. You can match them with rotations, reflections, and translations, called rigid motions.

WORKED EXAMPLE

Triangle ABC has A(21,22), B(24,22), and C(21,26). Rotate it 180 degrees about the origin, then translate it 5 units right.

1. Rotate 180 degrees: A(-21,-22), B(-24,-22), C(-21,-26).
2. Translate 5 units right: add 5 to each x-coordinate.
3. A'(-16,-22), B'(-19,-22), C'(-16,-26).

Answer: A'(-16,-22), B'(-19,-22), C'(-16,-26)

PRACTICE 5 problems

- 1** Triangle ABC has A(0,0), B(1,0), C(0,1). Its image has A'(7,7), B'(8,7), C'(7,8). Describe the transformation.

ANSWER _____

- 2** Triangle DEF has D(2,4), E(4,7), F(2,7). Its image has D'(-2,4), E'(-4,7), F'(-2,7). Name the transformation.

ANSWER _____

- 3** Triangle GHI has G(1,2), H(4,2), I(1,4). Its image has G'(-2,1), H'(-2,4), I'(-4,1). Name the transformation.

ANSWER _____

- 4** Triangle JKL has J(2,0), K(2,1), L(4,0). Rotate it 90 degrees clockwise about the origin, then translate it 4 units up. Give the image coordinates.

ANSWER _____

- 5** Triangle MNO has M(0,1), N(1,1), O(0,2). Its image has M'(7,-1), N'(8,-1), O'(7,-2). Describe one sequence of transformations.

ANSWER _____

APPLY IT Show your work

- 1** An esports club uses a triangular logo with points $A(1,0)$, $B(4,0)$, and $C(1,2)$. A screen version has $A'(0,-1)$, $B'(0,-4)$, and $C'(2,-1)$. What transformation made the screen version?

WORK SPACE

ANSWER _____

- 2** A student designs a banner with corners $P(0,1)$, $Q(2,1)$, $R(2,4)$, and $S(0,4)$. The printed banner has $P'(10,1)$, $Q'(8,1)$, $R'(8,4)$, and $S'(10,4)$. Describe a sequence that creates the printed banner.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Triangle PQR has $P(1,0)$, $Q(4,0)$, and $R(1,2)$. Its image has $P'(7,7)$, $Q'(7,4)$, and $R'(9,7)$. Using exactly two moves, a rotation and a translation, describe a sequence that maps PQR to $P'Q'R'$.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Triangle ABC has A(0,0), B(1,0), C(0,1). Its image has A'(7,7), B'(8,7), C'(7,8). Describe the transformation.	Translate 7 units right and 7 units up.
2	Triangle DEF has D(2,4), E(4,7), F(2,7). Its image has D'(-2,4), E'(-4,7), F'(-2,7). Name the transformation.	Reflect across the y-axis.
3	Triangle GHI has G(1,2), H(4,2), I(1,4). Its image has G'(-2,1), H'(-2,4), I'(-4,1). Name the transformation.	Rotate 90 degrees counterclockwise about the origin.
4	Triangle JKL has J(2,0), K(2,1), L(4,0). Rotate it 90 degrees clockwise about the origin, then translate it 4 units up. Give the image coordinates.	J'(0,2), K'(1,2), L'(0,0)
5	Triangle MNO has M(0,1), N(1,1), O(0,2). Its image has M'(7,-1), N'(8,-1), O'(7,-2). Describe one sequence of transformations.	Reflect across the x-axis, then translate 7 units right.

PART 2 • APPLY IT

- Rotate 90 degrees clockwise about the origin.** A 90-degree clockwise rotation maps (x,y) to $(y,-x)$. Each original point maps to its matching image point.
- Reflect across the y-axis, then translate 10 units right.** Reflecting changes each x-coordinate to its opposite. Translating 10 units right gives the listed image coordinates.

CHALLENGE

Rotate 90 degrees clockwise about the origin, then translate 7 units right and 8 units up.

Accept equivalent descriptions of the listed transformations. For items asking for a sequence, accept any sequence that maps every corresponding vertex correctly.