LESSON MAKER PRO

Moves Make Matches

Use rigid motions to show congruent figures.

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..."

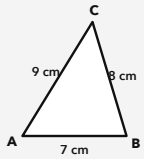
NAME _____ DATE _____

RIGID MOTION RULE

A rotation, reflection, or translation is a rigid motion, so it keeps side lengths and angle measures unchanged. If you can move one figure onto another with one or more rigid motions, the figures are congruent.

WORKED EXAMPLE

Triangle ABC shown is reflected across a vertical line, then translated to the right. Is the final triangle congruent to triangle ABC?



1. Reflect triangle ABC across a vertical line.
2. Translate the reflected triangle to the right.
3. Both moves keep all lengths and angle measures unchanged.

Answer: Yes, the final triangle is congruent to triangle ABC.

PRACTICE 4 problems

1 Triangle A(1,2), B(2,3), C(3,1) maps to A'(4,0), B'(5,1), C'(6,-1). What translation maps the triangle?

ANSWER _____

2 Rectangle PQRS maps as follows: P(1,1) to P'(-1,1), Q(3,1) to Q'(-3,1), R(3,2) to R'(-3,2), and S(1,2) to S'(-1,2). Name the transformation.

ANSWER _____

3 Triangle A(-2,1), B(-1,3), C(-3,2) maps to A'(1,2), B'(3,1), C'(2,3). Which rotation about the origin maps the triangle?

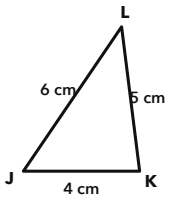
ANSWER _____

4 Triangle DEF has D(1,1), E(2,1), and F(1,3). Reflect it over the x-axis, then translate it 3 units left. Give D', E', and F'. Is the image congruent to triangle DEF?

ANSWER _____

APPLY IT Show your work

1 A game club uses the triangular badge shown. A banner copy is rotated 90° and moved to a new spot. Is the banner copy congruent to the badge? Explain.



ANSWER _____

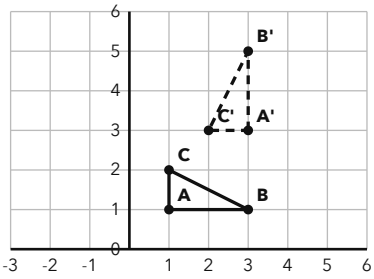
2 A dance crew's LED triangle has vertices A(1,2), B(3,1), and C(2,4). It is rotated 90° clockwise about the origin, then translated 3 units left and 1 unit up. What are the image coordinates? Name the sequence.

WORK SPACE

ANSWER _____

CHALLENGE One step up

The solid triangle ABC and dashed triangle A'B'C' are shown. Describe one sequence of two transformations that maps triangle ABC onto triangle A'B'C'.



WORK SPACE AND ANSWER

ANSWER KEY

Moves Make Matches

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Triangle A(1,2), B(2,3), C(3,1) maps to A'(4,0), B'(5,1), C'(6,-1). What translation maps the triangle?	**Translate 3 units right and 2 units down.**
2	Rectangle PQRS maps as follows: P(1,1) to P'(-1,1), Q(3,1) to Q'(-3,1), R(3,2) to R'(-3,2), and S(1,2) to S'(-1,2). Name the transformation.	**Reflection over the y-axis.**
3	Triangle A(-2,1), B(-1,3), C(-3,2) maps to A'(1,2), B'(3,1), C'(2,3). Which rotation about the origin maps the triangle?	**A 90° clockwise rotation about the origin.**
4	Triangle DEF has D(1,1), E(2,1), and F(1,3). Reflect it over the x-axis, then translate it 3 units left. Give D', E', and F'. Is the image congruent to triangle DEF?	**D'(-2,-1), E'(-1,-1), F'(-2,-3). Yes, the image is congruent to triangle DEF.**

PART 2 · APPLY IT

1. **Yes. A rotation and a translation are rigid motions, so the copy has the same side lengths and angle measures as the badge.** Rotation and translation do not change a figure's size or shape. Therefore the copied badge is congruent.
2. **A'(-1,0), B'(-2,-2), C'(1,-1). Rotate 90° clockwise about the origin, then translate 3 units left and 1 unit up.** A 90° clockwise rotation maps (x,y) to (y,-x). Then subtract 3 from each x-coordinate and add 1 to each y-coordinate.

CHALLENGE

Rotate triangle ABC 90° counterclockwise about the origin, then translate it 4 units right and 2 units up.

Accept equivalent wording for directions and transformations. For the challenge, accept any valid sequence that maps each corresponding vertex to its dashed image.