LESSON MAKER PRO

# Shape Moves

*Track points to test congruence*

**GRADE 7 · 7A.GM.C.42**

**7A.GM.C.42** "Verify experimentally the properties of rigid motions (rotations, reflections, and translations): lines are taken to lines, and line segments are taken to line segments of the same length; angles are taken to angles of the same measure..."

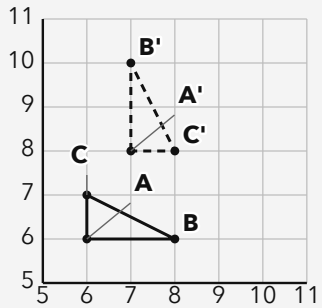
**NAME** _____ **DATE** _____

## THE BIG IDEA

A reflection, rotation, or translation keeps lengths and angle measures the same. Track matching vertices through each move. If they land on the second figure, the figures are congruent.

## WORKED EXAMPLE

What sequence maps the solid triangle onto the dashed triangle? Are they congruent?




1. Reflect over y = x: A, B, C move to (6, 6), (6, 8), (7, 6).
2. Translate right 1 and up 2: the vertices land on A', B', C'.
3. The triangles match, so they are congruent.

**Answer: Reflect over y = x, then translate right 1 and up 2. The triangles are congruent.**

## PRACTICE 4 problems

**1** Translate A(-4, -2) right 3 and up 4. Where is A'?

**ANSWER** _____

**2** Reflect B(-3, 4) across the y-axis. Where is B'?

**ANSWER** _____

**3** Rotate C(2, -4) 90° counterclockwise about the origin. Where is C'?

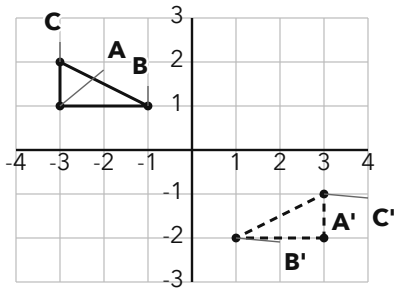
**ANSWER** _____

**4** A 53° angle is reflected, then rotated. What is its image measure?

**ANSWER** _____

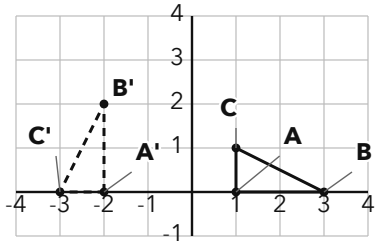
## APPLY IT Show your work

**1** A game designer flips and slides the solid sticker onto the dashed sticker. Name a reflection, then a translation, that does this. Are the stickers congruent?




**ANSWER** _____

**2** At a robotics club, the solid icon turns 90° counterclockwise about the origin, then slides onto the dashed icon. Which way and how far does it slide?




**ANSWER** _____

## CHALLENGE One step up

Triangle P has side lengths 9, 12, and 15 cm. Triangle Q has side lengths 9, 12, and 14 cm. Can a sequence of rigid motions map P onto Q? Explain.

WORK SPACE AND ANSWER

**ANSWER KEY**

# Shape Moves

**GRADE 7 · 7A.GM.C.42**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Translate A(-4, -2) right 3 and up 4. Where is A'? | **(-1, 2)** |
| 2 | Reflect B(-3, 4) across the y-axis. Where is B'? | **(3, 4)** |
| 3 | Rotate C(2, -4) 90° counterclockwise about the origin. Where is C'? | **(4, 2)** |
| 4 | A 53° angle is reflected, then rotated. What is its image measure? | **53°** |

## PART 2 · APPLY IT

1. **Reflect across the y-axis, then translate down 3 units. Yes, the stickers are congruent.** The reflection changes each x-coordinate's sign. Moving each result down 3 units places every vertex on its match.
2. **Left 2 units and down 1 unit.** After the rotation, A is at (0, 1). Moving it left 2 and down 1 reaches A', and the same move matches B and C.

## CHALLENGE

**No. Rigid motions keep side lengths the same, but P has a 15 cm side and Q does not.**

Accept any valid sequence that maps every labeled vertex in the first word problem. A matching image is congruent even when it has turned or flipped.