LESSON MAKER PRO

Move It Exactly

Use rigid motions to track points and preserve measures.

HIGH SCHOOL · HSG-CO.A

CCSS.Math.Content.HSG-CO.A "Experiment with transformations in the plane"

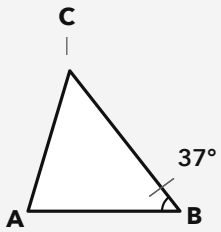
NAME _____ DATE _____

RIGID MOTION RULES

Translations, rotations, and reflections are rigid motions. They keep all side lengths and angle measures the same. Apply a coordinate rule to every vertex.

WORKED EXAMPLE

The triangle shown is reflected across a line. Find m∠B'.



1. A reflection is a rigid motion.
2. The figure shows m∠B = 37°.
3. A reflected angle has the same measure.

Answer: m∠B' = 37°

PRACTICE 4 problems

1 Translate P(-3, 4) 5 units right and 2 units down. Give P'.

ANSWER _____

2 Reflect Q(6, -1) across the y-axis. Give Q'.

ANSWER _____

3 Rotate R(-2, 5) 90° counterclockwise about the origin. Give R'.

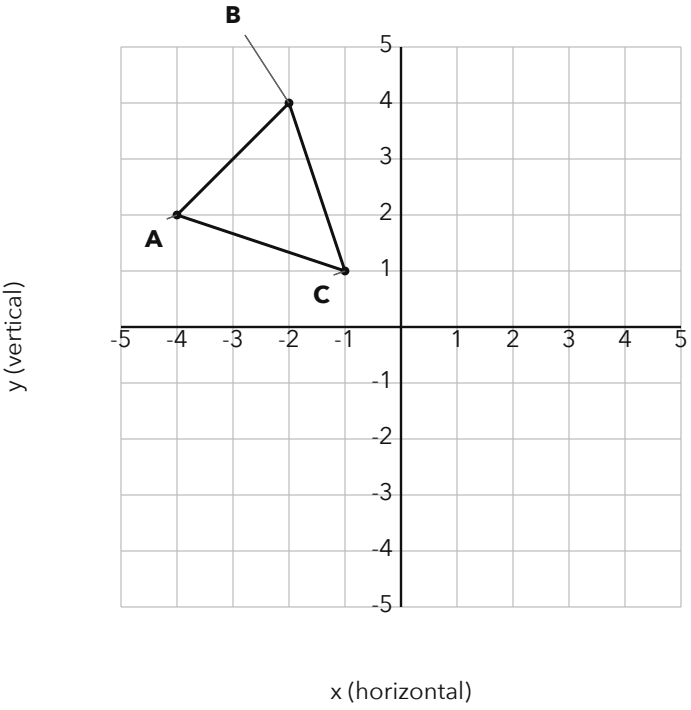
ANSWER _____

4 The rule (x, y) → (x + 2, y - 5) maps S to S'(4, -3). Give S.

ANSWER _____

APPLY IT Show your work

1 The grid shows logo triangle A(-4,2), B(-2,4), C(-1,1). Translate it 3 units right and 2 units down. Give A', B' and C'.



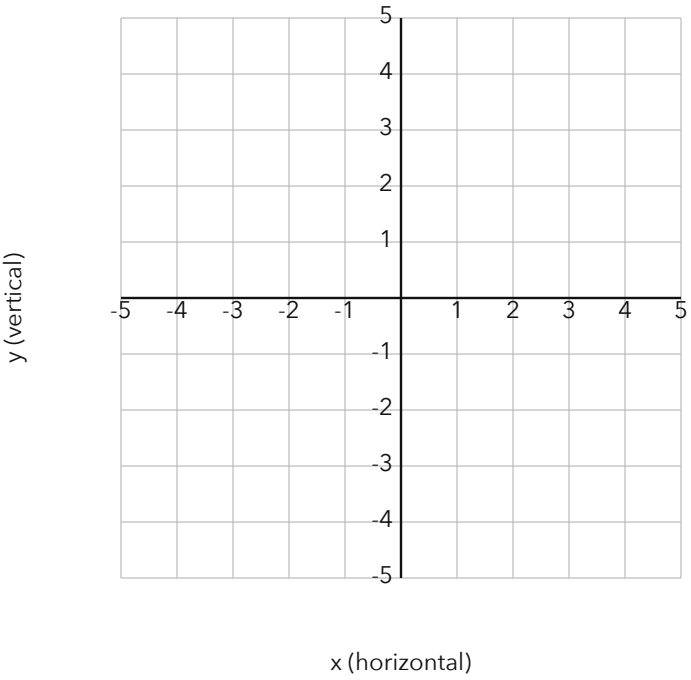
ANSWER _____

2 In a video game, a sprite point T(3, -4) rotates 90° clockwise about the origin. What are its new coordinates?

WORK SPACE

ANSWER _____

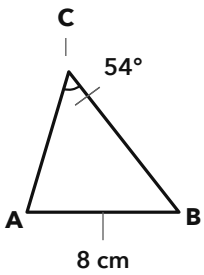
3 Experiment on the blank grid using a ruler and protractor (teacher supplies them). Draw triangle A(1,1), B(4,1), C(1,3), then construct its 90° clockwise rotation about O=(0,0). Label A',B',C' and connect them. Measure AB, AC and angle A, then their corresponding image measures; record all six measurements using grid units for lengths. What stays the same? Use extra paper if needed.



ANSWER _____

CHALLENGE One step up

The triangle shown is reflected, then translated. State A'B' and m∠C'. Explain why both values stay the same.



WORK SPACE AND ANSWER

Move It Exactly

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Translate P(-3, 4) 5 units right and 2 units down. Give P'.	**P'(2, 2)**
2	Reflect Q(6, -1) across the y-axis. Give Q'.	**Q'(-6, -1)**
3	Rotate R(-2, 5) 90° counterclockwise about the origin. Give R'.	**R'(-5, -2)**
4	The rule (x, y) → (x + 2, y - 5) maps S to S'(4, -3). Give S.	**S(2, 2)**

PART 2 · APPLY IT

1. **A'(-1, 0), B'(1, 2), C'(2, -1)** Add 3 to each x-coordinate and subtract 2 from each y-coordinate.
2. **T'(-4, -3)** For a 90° clockwise rotation, use (x, y) → (y, -x).
3. **A'(1,-1), B'(1,-4), C'(3,-1); AB=A'B'=3 units, AC=A'C'=2 units, angle A=angle A'=90°.** Use (x,y)→(y,-x). Require original and constructed image triangles plus recorded ruler/protractor comparisons. Convert ruler readings using one grid-square width; accept reasonable measurement tolerance. Both lengths and the right angle are preserved.

CHALLENGE

A'B' = 8 cm and m∠C' = 54°. Reflections and translations are rigid motions, so they preserve lengths and angle measures.

Accept coordinate notation with or without parentheses around ordered pairs. For the challenge, accept any correct statement that rigid motions preserve distance and angle measure. For Apply 3, inspect the actual constructed image and recorded before/after measurements; arithmetic alone is incomplete.

Apply 3 solution: original triangle and clockwise 90° image; corresponding lengths 3 and 2 units, and angles 90°.

