LESSON MAKER PRO

Transform and Compare

Use transformations to decide congruence and similarity.

HIGH SCHOOL · MA.912.GR.2

MA.912.GR.2 "Apply properties of transformations to describe congruence or similarity."

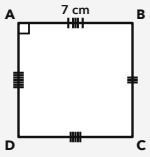
NAME _____ DATE _____

TRANSFORMATION FACTS

Translations, rotations, and reflections keep all lengths and angle measures the same. Their images are congruent to the original figure. A dilation multiplies every length by the same scale factor, so the image is similar.

WORKED EXAMPLE

The square shown is rotated 90°. Find the side length of the image. Is the image congruent or similar only?



1. A rotation is a rigid transformation.
2. Rigid transformations preserve side length.
3. The image side is 7 cm, so the figures are congruent.

Answer: 7 cm; congruent

PRACTICE 4 problems

1 Triangle ABC has side lengths 4 cm, 5 cm, and 6 cm. A reflection maps it to triangle DEF with matching side lengths. Are the triangles congruent or similar only?

ANSWER _____

2 A dilation centered at the origin has scale factor 3/2. It maps M(2, 4) to M'. Find M'.

ANSWER _____

3 A dilation maps a 10 cm segment to a 15 cm segment. Find the scale factor. Are the segments congruent or similar only?

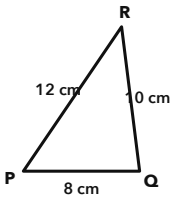
ANSWER _____

4 A reflection maps segment QR to segment Q'R'. If QR = 11 cm, find Q'R'.

ANSWER _____

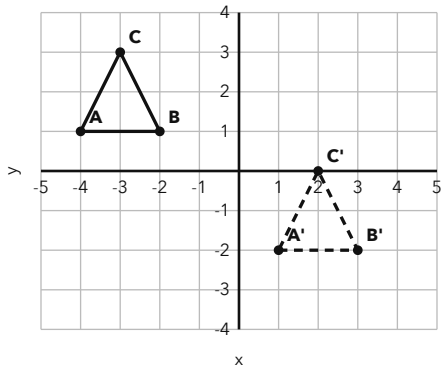
APPLY IT Show your work

1 A club is making a smaller triangular patch. The patch shown is dilated by a scale factor of 3/4. Give the three new side lengths.



ANSWER _____

2 A game designer shifts a triangular zone on a game map. The solid triangle is the original zone, and the dashed triangle is its image. Write the translation rule and classify the triangles.



ANSWER _____

CHALLENGE One step up

Triangle A(1, 1), B(5, 1), C(1, 4) maps to A'(-2, 2), B'(-10, 2), C'(-2, 8). Describe transformations that map the first triangle to the second. State the scale factor and explain whether the triangles are congruent.

WORK SPACE AND ANSWER

ANSWER KEY

Transform and Compare

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Triangle ABC has side lengths 4 cm, 5 cm, and 6 cm. A reflection maps it to triangle DEF with matching side lengths. Are the triangles congruent or similar only?	**Congruent**
2	A dilation centered at the origin has scale factor 3/2. It maps M(2, 4) to M'. Find M'.	**M'(3, 6)**
3	A dilation maps a 10 cm segment to a 15 cm segment. Find the scale factor. Are the segments congruent or similar only?	**Scale factor 3/2; similar only**
4	A reflection maps segment QR to segment Q'R'. If QR = 11 cm, find Q'R'.	**11 cm**

PART 2 · APPLY IT

1. **6 cm, 15/2 cm, 9 cm** Multiply each displayed side length by 3/4. The dilation creates a similar triangle.
2. **(x, y) -> (x + 5, y - 3); congruent** Each vertex moves 5 units right and 3 units down. A translation preserves lengths and angles, so the triangles are congruent.

CHALLENGE

Reflect across the y-axis, then dilate about the origin by scale factor 2. The triangles are similar, not congruent, because the dilation doubles every length.

Accept equivalent translation notation and either valid order for the reflection and dilation in the challenge. Accept 7.5 cm for 15/2 cm.