LESSON MAKER PRO

Shape Shift Paths

Practice, apply, and challenge similarity moves.

GRADE 8 · 8.G.A.4

CCSS.Math.Content.8.G.A.4 "Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures..."

NAME _____ DATE _____

THE BIG IDEA

Similar figures have the same shape, even if their size or position changes. Use rotations, reflections, translations, and dilations in order, then check that matching vertices land on their images.

WORKED EXAMPLE

Triangle A(13,11), B(14,11), C(13,12) is dilated about the origin by a scale factor of 7. Find the image.

1. Multiply each x-coordinate by 7.
2. Multiply each y-coordinate by 7.
3. Write the image vertices.

Answer: A'(91,77), B'(98,77), C'(91,84)

PRACTICE 5 problems

1 1. Triangle P(-4,5), Q(-6,5), R(-4,6) maps to P'(4,5), Q'(6,5), R'(4,6). Name the transformation.

ANSWER _____

2 2. M(-4,-6), N(-2,-6), O(-2,-4) maps to M'(-1,-2), N'(1,-2), O'(1,0). Describe the translation.

ANSWER _____

3 3. Triangle A(0,0), B(2,0), C(0,3) maps to A'(0,0), B'(6,0), C'(0,9). What dilation maps the triangle to its image?

ANSWER _____

4 4. Triangle A(1,4), B(3,4), C(1,6) is rotated 90 degrees counterclockwise about the origin, then translated right 5 units. Find A', B', and C'.

ANSWER _____

5 5. Triangle U(3,4), V(5,4), W(3,5) maps to U'(-6,8), V'(-10,8), W'(-6,10). Describe one sequence of transformations.

ANSWER _____

APPLY IT Show your work

1 APPLY 1. A game designer changes a triangular logo with vertices (1,1), (3,1), and (1,2) into a logo with vertices (-2,2), (-6,2), and (-2,4). Describe a sequence of transformations.

WORK SPACE

ANSWER _____

2 APPLY 2. A mural rectangle has vertices (1,-2), (3,-2), (3,0), and (1,0). Its copy has vertices (6,1), (10,1), (10,5), and (6,5). Describe a sequence of transformations.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

CHALLENGE. Triangle A(1,2), B(3,2), C(1,3) maps to A'(5,1), B'(5,5), C'(3,1). Describe one sequence of three transformations that maps the triangle to its image.

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ANSWER KEY # Shape Shift Paths

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	1. Triangle P(-4,5), Q(-6,5), R(-4,6) maps to P'(4,5), Q'(6,5), R'(4,6). Name the transformation.	**Reflection across the y-axis.**
2	2. M(-4,-6), N(-2,-6), O(-2,-4) maps to M'(-1,-2), N'(1,-2), O'(1,0). Describe the translation.	**Translate right 3 units and up 4 units.**
3	3. Triangle A(0,0), B(2,0), C(0,3) maps to A'(0,0), B'(6,0), C'(0,9). What dilation maps the triangle to its image?	**A dilation centered at the origin with scale factor 3.**
4	4. Triangle A(1,4), B(3,4), C(1,6) is rotated 90 degrees counterclockwise about the origin, then translated right 5 units. Find A', B', and C'.	**A'(1,1), B'(1,3), C'(-1,1)**
5	5. Triangle U(3,4), V(5,4), W(3,5) maps to U'(-6,8), V'(-10,8), W'(-6,10). Describe one sequence of transformations.	**Dilate about the origin by a scale factor of 2, then reflect across the y-axis.**

PART 2 · APPLY IT

1. **Dilate about the origin by a scale factor of 2, then reflect across the y-axis.** The image coordinates are twice the original coordinates, with each x-coordinate changed to its opposite.
2. **Dilate about the origin by a scale factor of 2, then translate right 4 units and up 5 units.** After dilating, the vertices are (2,-4), (6,-4), (6,0), and (2,0). Translating each point right 4 and up 5 gives the copy.

CHALLENGE

Rotate 90 degrees counterclockwise about the origin, dilate about the origin by a scale factor of 2, then translate right 9 units and down 1 unit.

Accept equivalent sequences when they produce every listed image point. For origin-centered transformations, a reflection and a dilation may be reversed when the final image is unchanged.