

INDEPENDENT VARIABLE

IDV WORKSHEETS



SEQUENCES OF TRANSFORMATIONS

SHAPES | THE GRID | DILATIONS | SIMILARITY

ANIMATED
POWERPOINT:
DOES THE WORK
FOR YOU!

FULL ANSWER
KEYS
INCLUDED

24 EXAMPLE
PROBLEMS
4 PRACTICE
SHEETS

LEVELED
PRACTICE +
FIND THE
MISTAKE

MORE PRACTICE. LESS PREP. BETTER OUTCOMES.

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Inside the Animated Lesson

INDEPENDENT VARIABLE

GRADE 8 • GEOMETRY

SEQUENCES OF TRANSFORMATIONS

WITH DILATIONS | SIMILARITY | RIGID MOTIONS

Animated PowerPoint lesson

Four parts • every guided problem animated
Practice sheets, find the mistake • full keys

MORE PRACTICE. LESS PREP. BETTER OUTCOMES.

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LESSON OVERVIEW

Today's Goals

I CAN...

- Perform a sequence of transformations, including dilations from a given center.
- Find the center and the scale factor of a dilation.
- Explain why a sequence that includes a dilation produces a similar (not congruent) figure.

KEY VOCABULARY

Pre-image the original figure	Image the figure after a transformation; labeled A' , A''
Rigid transformation translation, rotation, or reflection; size stays the same	Dilation enlarges or reduces a figure from a center point
Scale factor (k) $k > 1$ enlarges; $0 < k < 1$ reduces	Similar figures same shape, sides in proportion (~)

STANDARDS

CCSS 8.G.A.3 CCSS 8.G.A.4 HSG.SRT.A.1 HSG.SRT.A.2

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QUICK REVIEW

Rigid vs. Non-Rigid Transformations

RIGID
Translate • Rotate • Reflect

- ✓ Same size
- ✓ Same shape
- ✓ Distances and angles preserved

Result: CONGRUENT $\cong$

NON-RIGID
Dilate

- ✓ New size
- ✓ Same shape
- ✓ Angles preserved; side lengths multiplied by k

Result: SIMILAR $\sim$

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GUIDED PROBLEM 3 • PART 1: SHAPE SEQUENCES • TRAPEZOID

PART 1

3.

Sequence: 1) Rotate 90° clockwise about C
2) Dilate by a scale factor of 1.5 from C

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GUIDED PROBLEM 1 • PART 2: SEQUENCES ON THE GRID

PART 2

1. Translate 3 units right, then dilate by a scale factor of 2 from C' .

Step 1: Translate 3 units right.

Step 2: Dilate by a scale factor of 2 from C' .

Final: $A''(0, -1)$ $B''(4, 1)$ $C''(-2, 5)$

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GUIDED PROBLEM 1 • PART 3: IDENTIFY THE DILATION

PART 3

1. Identify the dilation shown on the graph.

Center: $P(4, 4)$

$k = 2$

P to $A = 3$, P to $A' = 6$: $k = 6 \div 3 = 2$

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GUIDED PROBLEM 1 • PART 4: CONGRUENT OR SIMILAR?

PART 4

1. A figure undergoes this sequence of transformations:

- reflect over the x-axis
- rotate 270° clockwise
- rotate 90° clockwise

Circle one: **Congruent** Similar

Why: No dilation was used, so the side lengths and angles stay the same.

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GUIDED PROBLEM 3 • PUT IT TOGETHER

PUT IT TOGETHER

3. A figure undergoes this sequence of transformations:

- reflect over the y-axis
- dilate by a scale factor of 4 centered at $(-1, -4)$

Circle one: Congruent **Similar**

Why: The sequence includes a dilation, which changes the side lengths.

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Directions: Fill in the notes. For each shape, ask the questions you need (translate? rotate? reflect? dilate? order?), then perform the sequence with a centimeter ruler.

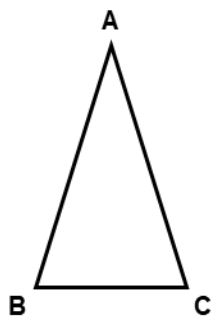
PART 1 • NOTES

A sequence is moves done in _____. Each new image gets one more _____: A', then A''.

A dilation changes the _____, not the shape: $k > 1$ is bigger, $0 < k < 1$ is _____.

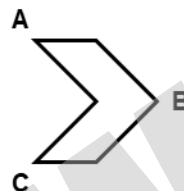
GUIDED PROBLEMS

1.



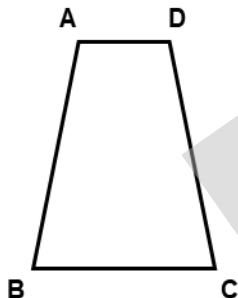
Sequence: _____

2.



Sequence: _____

3.



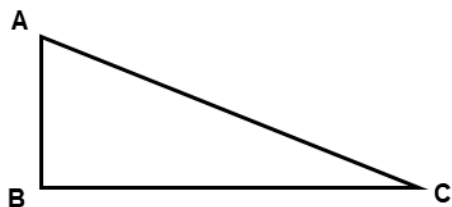
Sequence: _____

4.



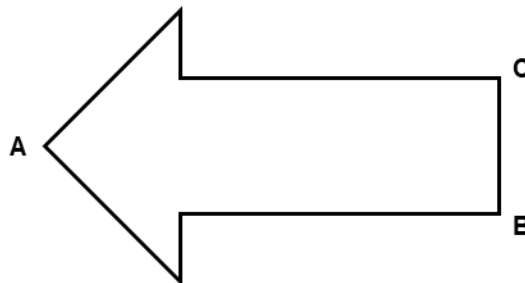
Sequence: _____

5.



Sequence: _____

6.



Sequence: _____

Directions: Fill in the notes. Then perform each sequence with the class: draw and label $A'B'C'$, then $A''B''C''$, and write the final coordinates.

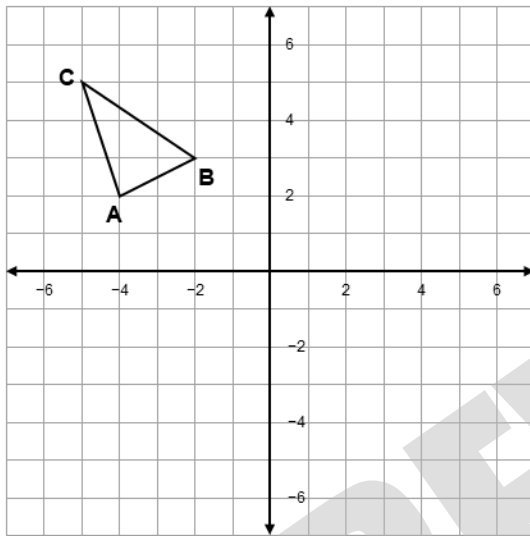
PART 2 • NOTES

Do step 1 first. Then dilate the _____ $A'B'C'$, not the pre-image.

Each point ends up _____ times as far from the center. The center does _____.

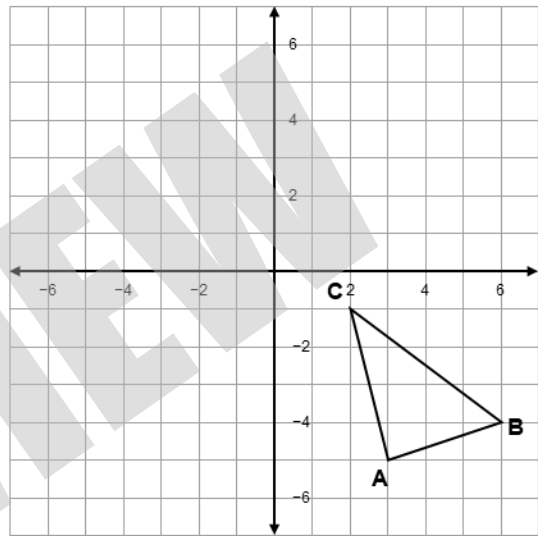
GUIDED PROBLEMS

1. Translate 3 units right, then dilate by a scale factor of 2 from C' .



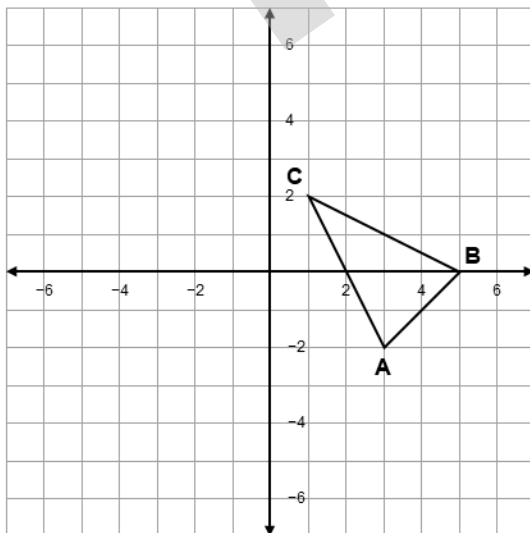
Final: _____

2. Reflect across the y-axis, then dilate by a scale factor of 2 from B' .



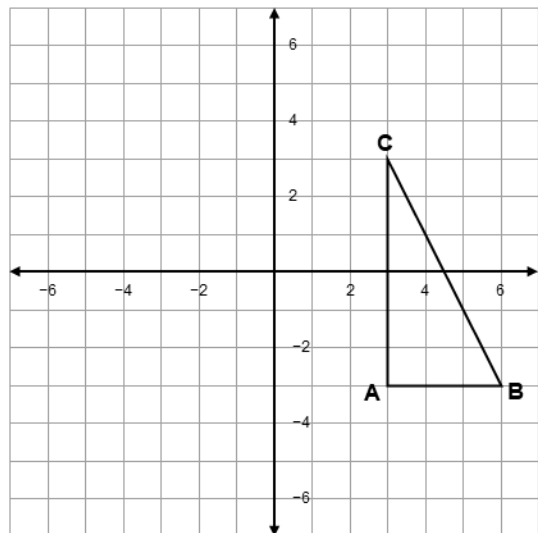
Final: _____

3. Rotate 180° about the origin, then dilate by a scale factor of 1.5 from A' .



Final: _____

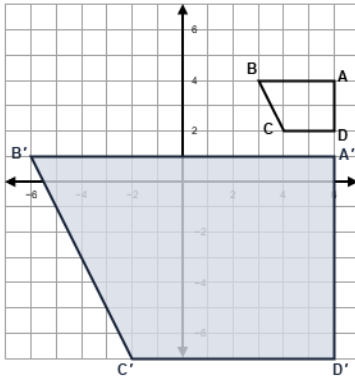
4. Rotate 90° counterclockwise about the origin, then dilate by a scale factor of $\frac{1}{3}$ from the origin.



Final: _____

Directions: Identify each dilation: find the center P (lines through matching points), then $k = \text{image distance} \div \text{pre-image distance}$.

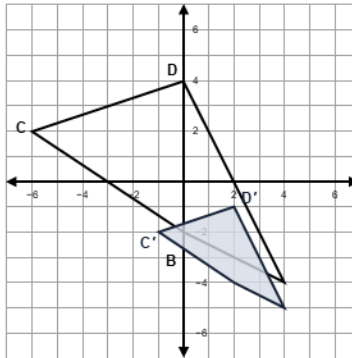
1. Identify the dilation shown on the graph.



Center: _____

 $k =$ _____

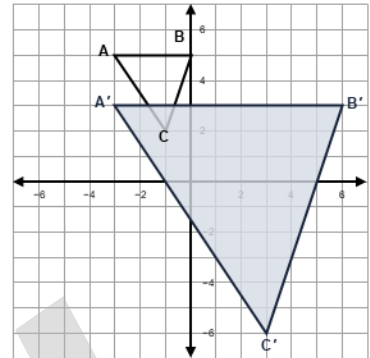
2. Identify the dilation shown on the graph.



Center: _____

 $k =$ _____

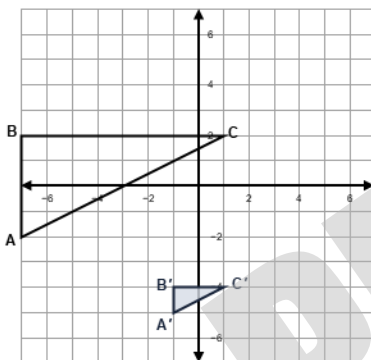
3. Identify the dilation shown on the graph.



Center: _____

 $k =$ _____

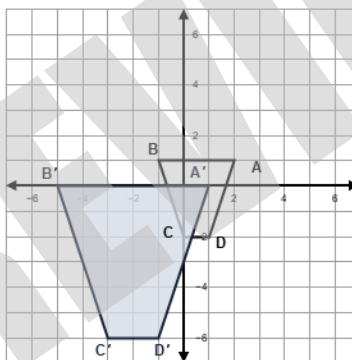
4. Identify the dilation shown on the graph.



Center: _____

 $k =$ _____

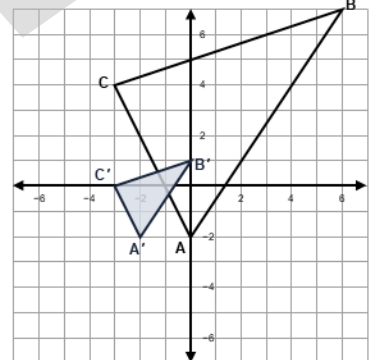
5. Identify the dilation shown on the graph.



Center: _____

 $k =$ _____

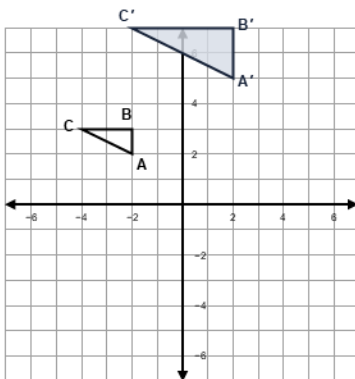
6. Identify the dilation shown on the graph.



Center: _____

 $k =$ _____

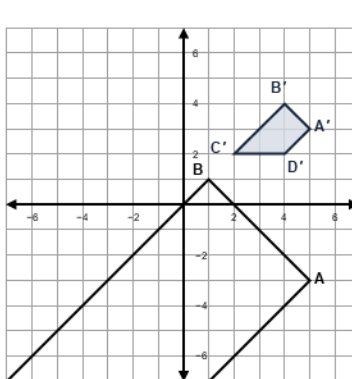
7. Identify the dilation shown on the graph.



Center: _____

 $k =$ _____

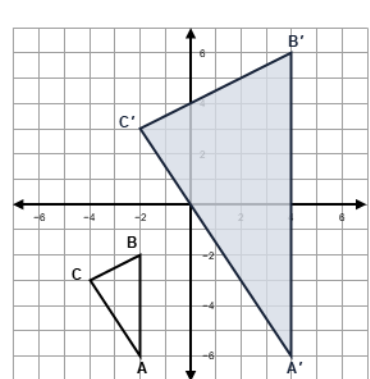
8. Identify the dilation shown on the graph.



Center: _____

 $k =$ _____

9. Identify the dilation shown on the graph.



Center: _____

 $k =$ _____