LESSON MAKER PRO

Shape Shift

Map one figure onto another.

HIGH SCHOOL · GDA.GM.F.27

GDA.GM.F.27 "Given two figures, determine whether they are similar by identifying a similarity transformation (sequence of rigid motions and dilations) that maps one figure to the other."

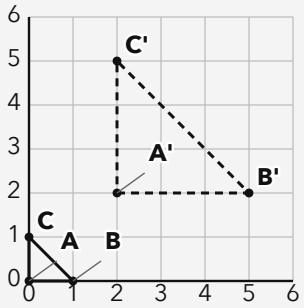
NAME _____ DATE _____

THE BIG IDEA

Similar figures have the same shape. To show they are similar, give a sequence of moves that maps one onto the other. Translations and rotations keep lengths the same, while a dilation multiplies every length by one scale factor.

WORKED EXAMPLE

What sequence maps solid triangle ABC to dashed triangle A'B'C'?



1. Dilate ABC by a factor of 3 about the origin.
2. Translate the result 2 units right and 2 units up.

Answer: The two triangles are similar.

PRACTICE 4 problems

1 ABC: A(0,0), B(6,0), C(0,9). DEF: D(0,0), E(12,0), F(0,18). Give a similarity transformation from ABC to DEF.

ANSWER _____

2 ABC: A(0,0), B(8,0), C(0,12). DEF: D(0,0), E(4,0), F(0,6). Give a similarity transformation from ABC to DEF.

ANSWER _____

3 ABC: A(0,0), B(4,0), C(0,8). DEF: D(9,7), E(9, 11), F(1,7). Give a sequence that maps ABC to DEF.

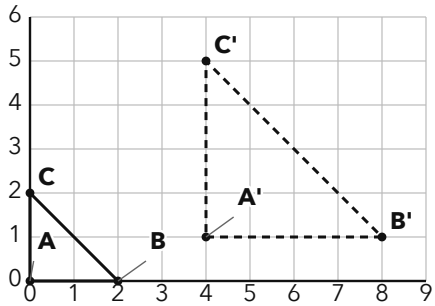
ANSWER _____

4 ABC: A(0,0), B(6,0), C(0,8). DEF: D(0,0), E(9, 0), F(0,10). Are the triangles similar? Justify.

ANSWER _____

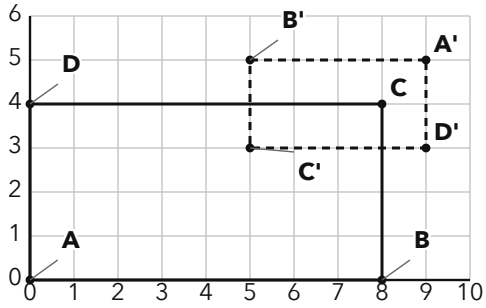
APPLY IT Show your work

1 A streamer enlarges a logo. What sequence maps the solid logo to the dashed logo?



ANSWER _____

2 A designer turns and shrinks a card icon. What sequence maps the solid icon to the dashed icon?



ANSWER _____

CHALLENGE One step up

ABC: A(0,0), B(6,0), C(0,8). DEF: D(4,3), E(4,15), F(-12,3). Give a sequence that maps ABC to DEF.

WORK SPACE AND ANSWER

Shape Shift

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	ABC: A(0,0), B(6,0), C(0,9). DEF: D(0,0), E(12,0), F(0,18). Give a similarity transformation from ABC to DEF.	**Dilate by a factor of 2 about the origin.**
2	ABC: A(0,0), B(8,0), C(0,12). DEF: D(0,0), E(4,0), F(0,6). Give a similarity transformation from ABC to DEF.	**Dilate by a factor of 1/2 about the origin.**
3	ABC: A(0,0), B(4,0), C(0,8). DEF: D(9,7), E(9,11), F(1,7). Give a sequence that maps ABC to DEF.	**Rotate 90° counterclockwise about the origin, then translate 9 units right and 7 units up.**
4	ABC: A(0,0), B(6,0), C(0,8). DEF: D(0,0), E(9,0), F(0,10). Are the triangles similar? Justify.	**No. The corresponding legs have ratios 9/6 = 3/2 and 10/8 = 5/4, so one dilation cannot map ABC to DEF.**

PART 2 · APPLY IT

1. **Dilate by a factor of 2 about the origin, then translate 4 units right and 1 unit up.** Dilation doubles each side. The translation then maps A to A' and the other corresponding vertices onto each other.
2. **Rotate 180° about the origin, dilate by a factor of 1/2 about the origin, then translate 9 units right and 5 units up.** The rotation reverses the directions of the sides, and the dilation halves their lengths. The translation maps A to A' and aligns the remaining vertices.

CHALLENGE

Rotate 90° counterclockwise about the origin, dilate by a factor of 2 about the origin, then translate 4 units right and 3 units up.

Accept any valid sequence that maps every named vertex to its corresponding vertex. For problem 4, accept any correct comparison showing that one scale factor cannot map the triangles.