LESSON MAKER PRO

Scale It Out

Find image coordinates after a dilation from the origin.

GRADE 7 · 7.MG.4.a

7.MG.4.a "Given a preimage in the coordinate plane, identify the coordinates of the image of a polygon that has been dilated. Scale factors are limited to 14, 12, 2, 3, or 4. The center of the dilation will be the origin."

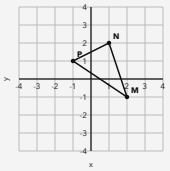
NAME _____ DATE _____

MULTIPLY FROM THE ORIGIN

When the center is the origin, multiply both coordinates of every vertex by the scale factor. A factor greater than 1 moves points farther from the origin, while a factor less than 1 moves points closer.

WORKED EXAMPLE

The grid shows triangle MNP. Dilate it by a scale factor of 2 from the origin. Find M', N', and P'.



1. M(2, -1) becomes M'(2 · 2, -1 · 2).
2. M' = (4, -2).
3. N' = (2, 4) and P' = (-2, 2).

Answer: M'(4, -2), N'(2, 4), P'(-2, 2)

PRACTICE 4 problems

1 Triangle JKL has J(-6, 4), K(-2, 8), and L(4, -4). Dilate it by 1/2 from the origin.

ANSWER _____

2 Rectangle QRST has Q(-2, -1), R(1, -1), S(1, 2), and T(-2, 2). Dilate it by 3 from the origin.

ANSWER _____

3 Triangle ABC has A(-1, 1), B(0, 2), and C(2, 0). Dilate it by 4 from the origin.

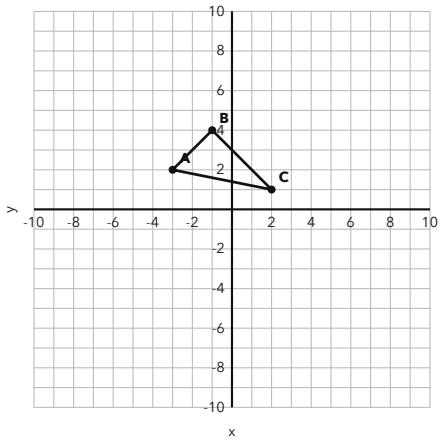
ANSWER _____

4 Quadrilateral WXYZ has W(-8, 4), X(-4, 8), Y(4, 8), and Z(8, 4). Dilate it by 1/4 from the origin.

ANSWER _____

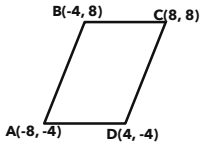
APPLY IT Show your work

1 A game designer enlarges the badge on the grid by a scale factor of 2 from the origin. Find the image coordinates.



ANSWER _____

2 The coordinate labels on this skateboard sticker give its preimage vertices. It is reduced by 1/4 from the origin. Find the image coordinates.



ANSWER _____

CHALLENGE One step up

Triangle RST has R(6, -10), S(-4, 8), and T(2, 4). It is dilated by 1/2 from the origin. Luis says to divide only each x-coordinate by 2. Is Luis correct? Explain, then give the image coordinates.

WORK SPACE AND ANSWER

ANSWER KEY

Scale It Out

GRADE 7 · 7.MG.4.a

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Triangle JKL has J(-6, 4), K(-2, 8), and L(4, -4). Dilate it by 1/2 from the origin.	**J'(-3, 2), K'(-1, 4), L'(2, -2)**
2	Rectangle QRST has Q(-2, -1), R(1, -1), S(1, 2), and T(-2, 2). Dilate it by 3 from the origin.	**Q'(-6, -3), R'(3, -3), S'(3, 6), T'(-6, 6)**
3	Triangle ABC has A(-1, 1), B(0, 2), and C(2, 0). Dilate it by 4 from the origin.	**A'(-4, 4), B'(0, 8), C'(8, 0)**
4	Quadrilateral WXYZ has W(-8, 4), X(-4, 8), Y(4, 8), and Z(8, 4). Dilate it by 1/4 from the origin.	**W'(-2, 1), X'(-1, 2), Y'(1, 2), Z'(2, 1)**

PART 2 · APPLY IT

1. **A'(-6, 4), B'(-2, 8), C'(4, 2)** Multiply each coordinate shown on the badge by 2.
2. **A'(-2, -1), B'(-1, 2), C'(2, 2), D'(1, -1)** Multiply each x-coordinate and y-coordinate by 1/4.

CHALLENGE

Luis is incorrect because both coordinates must be multiplied by 1/2. R'(3, -5), S'(-2, 4), T'(1, 2).

Accept equivalent coordinate notation and correctly matched prime labels. In the challenge, accept any clear statement that both x- and y-coordinates are multiplied by the scale factor.