LESSON MAKER PRO

Scale and Slide

Dilate coordinate figures from the origin.

GRADE 8 · TEKS 8.3.C

8.3.C "use an algebraic representation to explain the effect of a given positive rational scale factor applied to two-dimensional figures on a coordinate plane with the origin as the center of dilation."

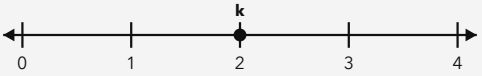
NAME _____ DATE _____

MULTIPLY FROM THE ORIGIN

A dilation centered at the origin multiplies both coordinates by the positive scale factor k. For a point (x, y), the image is (kx, ky). A factor greater than 1 makes the figure farther from the origin, while a factor between 0 and 1 moves it closer.

WORKED EXAMPLE

The number line shows k. Triangle ABC has A(1, -3), B(4, 1), and C(-2, 2). Dilate the triangle about the origin.



1. k = 2.
2. A' = (2(1), 2(-3)) = (2, -6).
3. B' = (2(4), 2(1)) = (8, 2).
4. C' = (2(-2), 2(2)) = (-4, 4).

Answer: A'(2, -6), B'(8, 2), C'(-4, 4)

PRACTICE 4 problems

1 Point P(-8, 12) is dilated about the origin by k = 1/4. Find P'.

ANSWER _____

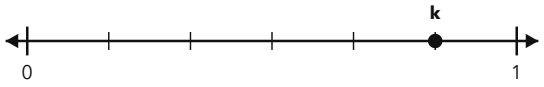
2 Point Q(15, -10) is dilated about the origin by k = 3/5. Find Q'.

ANSWER _____

3 Triangle RST has R(6, 9), S(-9, 6), and T(3, -12). Dilate it about the origin by k = 1/3.

ANSWER _____

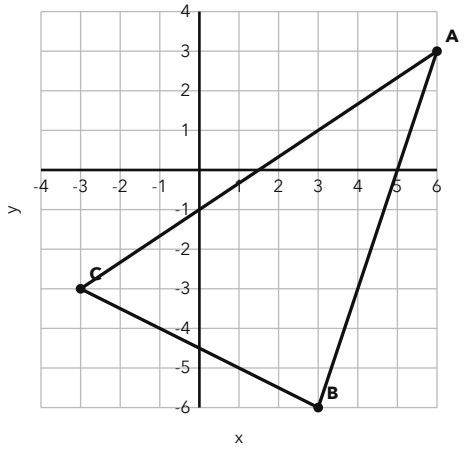
4 The number line shows k. Point D(18, -24) is dilated about the origin. Find D' and tell whether D' is closer to or farther from the origin.



ANSWER _____

APPLY IT Show your work

1 A game designer uses the triangle on the coordinate plane for a game badge. She scales it by k = 1/3 about the origin. What are the image coordinates?



ANSWER _____

2 A dance team scales its logo triangle with vertices M(-6, 3), N(9, -3), and O(3, 6) by k = 7/3 about the origin. What are the image coordinates?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Point E(-12, 8) maps to E'(-18, 12) in a dilation centered at the origin. Find k. Explain how the coordinates show that the distance from the origin changed.

WORK SPACE AND ANSWER

ANSWER KEY

Scale and Slide

GRADE 8 · TEKS 8.3.C

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Point P(-8, 12) is dilated about the origin by k = 1/4. Find P'.	**P'(-2, 3)**
2	Point Q(15, -10) is dilated about the origin by k = 3/5. Find Q'.	**Q'(9, -6)**
3	Triangle RST has R(6, 9), S(-9, 6), and T(3, -12). Dilate it about the origin by k = 1/3.	**R'(2, 3), S'(-3, 2), T'(1, -4)**
4	The number line shows k. Point D(18, -24) is dilated about the origin. Find D' and tell whether D' is closer to or farther from the origin.	**D'(15, -20), closer to the origin**

PART 2 · APPLY IT

1. **A'(2, 1), B'(1, -2), C'(-1, -1)** Multiply each vertex coordinate by 1/3.
2. **M'(-14, 7), N'(21, -7), O'(7, 14)** Multiply every x-coordinate and y-coordinate by 7/3.

CHALLENGE

k = 3/2. Both coordinates were multiplied by 3/2, so E' is 3/2 as far from the origin as E.

Accept ordered coordinate pairs and equivalent fraction forms. For the challenge, accept an explanation that both coordinates, and therefore the distance from the origin, are multiplied by 3/2.