

Scale It Right

Use transformations to compare size and shape.

GRADE 8 • 8.G.A

CCSS.Math.Content.8.G.A "Understand congruence and similarity using physical models, transparencies, or geometry software."

NAME _____

DATE _____

DILATION AND CONGRUENCE

A dilation centered at the origin multiplies each coordinate and each length by the scale factor k . Its image is similar to the original, and its area is multiplied by $k \times k$. A translation, reflection, or rotation keeps size and shape the same, so the image is congruent to the original.

WORKED EXAMPLE

Point $P(11, -17)$ is dilated about the origin with scale factor 13. Find P' .

1. Multiply the x-coordinate: $11 \times 13 = 143$.
2. Multiply the y-coordinate: $-17 \times 13 = -221$.
3. Write the image coordinates as $P'(143, -221)$.

Answer: $P'(143, -221)$

PRACTICE 6 problems

- 1** Point $A(1, -2)$ is dilated about the origin with scale factor 5. Find A' .

ANSWER _____

- 2** Point $B(-10, 14)$ is dilated about the origin with scale factor $1/2$. Find B' .

ANSWER _____

- 3** Point $C(2, -1)$ is dilated about the origin and maps to $C'(14, -7)$. What is the scale factor?

ANSWER _____

- 4** A rectangle has side lengths 8 cm and 16 cm. It is dilated using a scale factor of $1/2$. What are the new side lengths?

ANSWER _____

- 5** A triangle is reflected across a line. Which description is correct: congruent, or similar but not congruent?

ANSWER _____

- 6** A segment with length 7 cm is dilated to a segment with length 14 cm. What is the scale factor?

ANSWER _____

APPLY IT Show your work

- 1** An esports club enlarges a rectangular logo that is 8 cm wide and 14 cm tall. The scale factor is $\frac{5}{2}$. What are the new dimensions and the area of the enlarged logo?

WORK SPACE

ANSWER _____

- 2** A student changes an album-cover sketch from 6 cm by 10 cm to 15 cm by 25 cm. Is the new sketch a dilation of the original? State the scale factor and the relationship between the figures.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A triangular patch has side lengths 7 cm, 24 cm, and 25 cm. Its area is 84 cm^2 . The patch is enlarged by a dilation with scale factor $\frac{5}{2}$. What is the area of the enlarged patch? Explain how you know.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Point A(1, -2) is dilated about the origin with scale factor 5. Find A'.	A'(5, -10)
2	Point B(-10, 14) is dilated about the origin with scale factor $\frac{1}{2}$. Find B'.	B'(-5, 7)
3	Point C(2, -1) is dilated about the origin and maps to C'(14, -7). What is the scale factor?	7
4	A rectangle has side lengths 8 cm and 16 cm. It is dilated using a scale factor of $\frac{1}{2}$. What are the new side lengths?	4 cm and 8 cm
5	A triangle is reflected across a line. Which description is correct: congruent, or similar but not congruent?	congruent
6	A segment with length 7 cm is dilated to a segment with length 14 cm. What is the scale factor?	2

PART 2 • APPLY IT

- 20 cm wide, 35 cm tall, and 700 cm²** Multiply each dimension by $\frac{5}{2}$ to get 20 cm and 35 cm. Multiply the new dimensions, 20×35 , to find the area.
- Yes. The scale factor is $\frac{5}{2}$, and the figures are similar.** Compare corresponding side lengths: $\frac{15}{6} = \frac{5}{2}$ and $\frac{25}{10} = \frac{5}{2}$. Since both ratios match, the change is a dilation and the figures are similar.

CHALLENGE

525 cm². The area is multiplied by $(\frac{5}{2}) \times (\frac{5}{2})$, so $84 \times \frac{25}{4} = 525$.

Accept coordinate pairs written with or without the point label. For dilation area problems, accept an equivalent correct explanation that area scales by the square of the scale factor.