LESSON MAKER PRO

Scale Factor Check

Use segment lengths to test a dilation.

HIGH SCHOOL · GEO-G.SRT.1.b

GEO-G.SRT.1.b "Verify experimentally that the dilation of a line segment is longer or shorter in the ratio given by the scale factor."

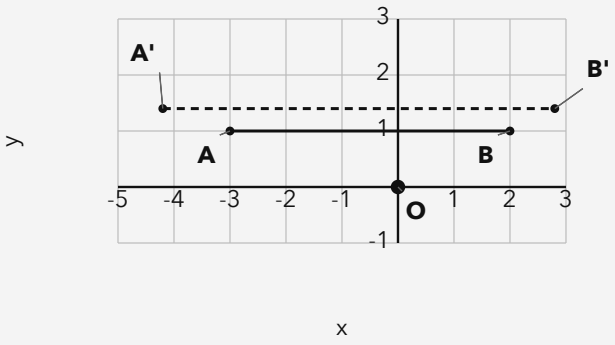
NAME _____ DATE _____

LENGTH RULE

A dilation with scale factor k changes every segment length by |k|. To verify a dilation, divide the image length by the original length and compare the result to |k|.

WORKED EXAMPLE

The solid segment AB and dashed segment A'B' are shown on the grid. Verify that the dilation centered at O has scale factor 7/5.



1. Count AB = 5 units.
2. Count A'B' = 7 units.
3. Find image/original = 7/5.
4. The ratio matches the scale factor.

Answer: Yes. A'B'/AB = 7/5.

PRACTICE 4 problems

1 A segment is 8 units long. It is dilated by a scale factor of 1/2. Find the image length.

ANSWER _____

2 A segment is 9 units long. A dilation has scale factor 2/3. Find the image length.

ANSWER _____

3 An image segment is 18 units long after a dilation with scale factor 9/4. Find the original length.

ANSWER _____

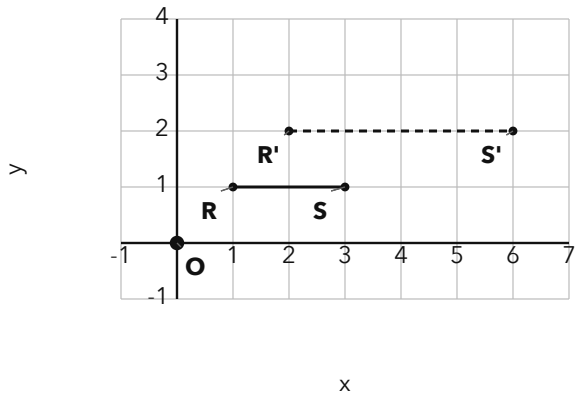
4 A 12-unit segment has a 16-unit image. Does this verify a scale factor of 4/3? Show the ratio.

ANSWER _____

_____

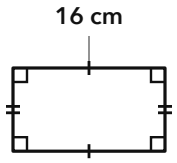
APPLY IT Show your work

1 A game designer dilates the solid route segment to make the dashed route segment on the coordinate grid. What is the scale factor?



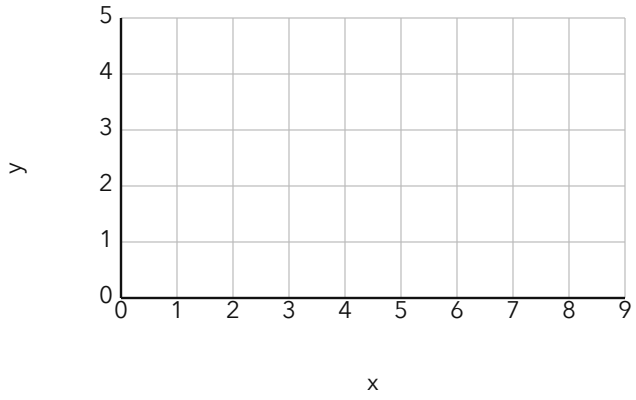
ANSWER _____

2 The rectangle in the figure is a club banner. A print shop makes a scale drawing with scale factor 3/4. What is the drawing's labeled side length?



ANSWER _____

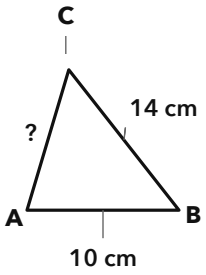
3 Experiment on the blank grid: plot center O(0,0), A(1,1) and B(4,1), and draw AB. Construct a dilation with scale factor 2: draw rays OA and OB, then mark A′ and B′ twice as far from O along their rays. Draw A′B′. Measure each segment by counting grid units or using a ruler with one consistent unit; record both lengths and divide image length by original length. Compare the observed ratio with the scale factor and explain. Show the actual construction and measurements.



ANSWER _____

CHALLENGE One step up

The triangle in the figure is the original logo. Its image has corresponding side lengths 15 cm, 21 cm, and 27 cm. Find the scale factor and the original third side length. Explain by comparing ratios.



WORK SPACE AND ANSWER

ANSWER KEY

Scale Factor Check

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A segment is 8 units long. It is dilated by a scale factor of 1/2. Find the image length.	**4 units**
2	A segment is 9 units long. A dilation has scale factor 2/3. Find the image length.	**6 units**
3	An image segment is 18 units long after a dilation with scale factor 9/4. Find the original length.	**8 units**
4	A 12-unit segment has a 16-unit image. Does this verify a scale factor of 4/3? Show the ratio.	**Yes; 16/12 = 4/3.**

PART 2 · APPLY IT

1. **2** The original segment RS is 2 units long, and R'S' is 4 units long. The ratio 4/2 is 2.
2. **12 cm** Multiply the shown 16 cm side by 3/4. The image side is 12 cm.
3. **A′(2,2), B′(8,2). AB=3 grid units; A′B′=6 grid units; image/original=6/3=2, matching the scale factor.** Check original and image segments along the constructed rays. If measured on paper with a ruler, lengths depend on print size but the ratio should be approximately 2; accept reasonable measurement tolerance with correct construction. Calculations alone without a drawn experiment do not complete this application.

CHALLENGE

Scale factor = 3/2; original third side = 18 cm. The ratios are 15/10 = 21/14 = 27/18 = 3/2.

Accept equivalent ratio forms and correct work using image length divided by original length. For the challenge, accept an explanation that shows all corresponding side-length ratios equal 3/2. For the experiment, inspect the learner's actual dilation construction and recorded observations or measurements, not just the numerical answer.