

Congruent and Similar Figures Through Dilations

Grade 8 math · Test · Standards: 8.G.A.2, 8.G.A.3, 8.G.A.4

Name: _____ Date: _____ Class: _____

This test covers congruence by rigid motions and similarity by dilations. It has 8 questions worth 20 points and should take about 45 minutes. Show every multiplication and ratio, and label each image vertex clearly.

Standards: 8.G.A.2, 8.G.A.3, 8.G.A.4 · **Level:** Grade 8

Time: 45 minutes · 8 questions · Total: 20 points · Calculator: as allowed by your teacher

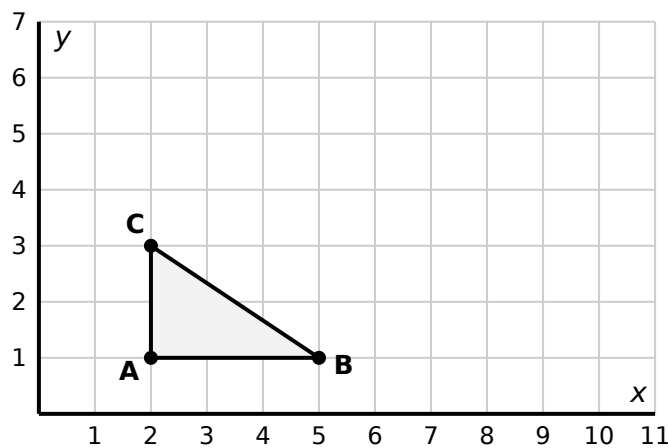
Question 1 Dilate two points (2 points)

Dilate each point about the origin.

- $(-6, 9)$ with scale factor $\frac{1}{3}$ (1 point)
- $(4, -5)$ with scale factor 3 (1 point)

Question 2 Dilate a triangle (3 points)

Triangle ABC is shown. It is dilated about the origin with scale factor 2.



Triangle ABC.

- Find the coordinates of A' , B' , and C' . (2 points)
- Find the ratio $A'B' : AB$. (1 point)

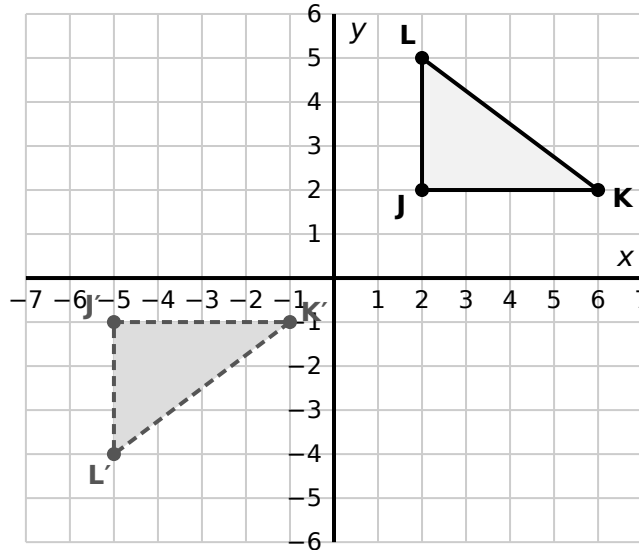
Question 3 Recover the factor (3 points)

A dilation about the origin sends $A(4, 6)$ to $A'(10, 15)$.

- Find the scale factor. (1 point)
- B is $(-2, 8)$. Find B' . (1 point)
- A side of the original figure is 8 units long. How long is the matching side of the image? (1 point)

Question 4 Congruent triangles (3 points)

The figure shows $\triangle JKL$ and $\triangle J'K'L'$.



$\triangle JKL$ and $\triangle J'K'L'$.

- Describe a sequence of rigid motions that maps $\triangle JKL$ onto $\triangle J'K'L'$. (2 points)
- Are the triangles congruent? Give a reason. (1 point)

Question 5 Similar rectangles (3 points)

Rectangle P is 9 cm by 12 cm. Rectangle Q is 6 cm by 8 cm.

- Are P and Q similar? Show your work. (2 points)
- Find the ratio of the perimeter of P to the perimeter of Q. (1 point)

Question 6 Missing side (2 points)

Two triangles are similar. The first has sides 14, 21, and 28. The second has sides 10, 15, and x . Find x .

Question 7 Dilated segment (2 points)

Segment UV has endpoints $U(4, 6)$ and $V(-8, 2)$. It is dilated about the origin by a factor of $3/2$.

- Find U' and V' . (1 point)
- How does the length of $U'V'$ compare with the length of UV? (1 point)

Question 8 Toy car model (2 points)

A toy model of a car is built at a scale of 1 : 48. The model is 9 inches long. How long is the real car in feet?