

Geometry - Dilations and Similarity - Worksheet

Common Core G-SRT.A.1, G-SRT.A.2, G-SRT.A.3 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice dilations, scale factors, similar figures and the AA criterion (Common Core G-SRT.A.1 to G-SRT.A.3). The first problems are quick one-step checks of the definitions and formulas from the lesson. The middle problems ask for diagrams, equations and careful reasoning in the style of a high school Geometry class. The last six problems are scaling, shadow and model problems.

Geometry · Common Core State Standards: **G-SRT.A.1, G-SRT.A.2, G-SRT.A.3**

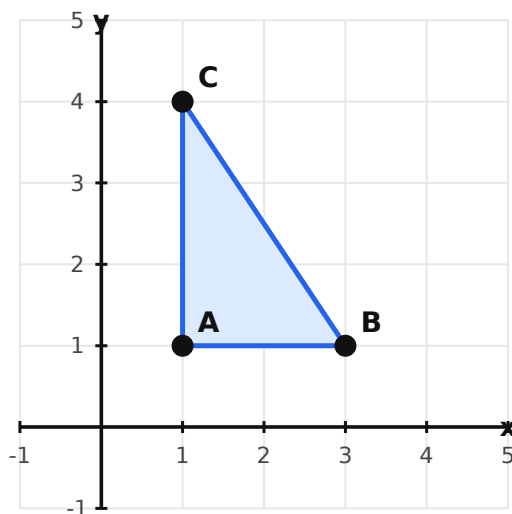
Exercise 1 - Dilate a point

Dilate $(3, -2)$ with center at the origin and scale factor 3.

Exercise 2 - Reduction

Dilate $(8, 12)$ with center at the origin and scale factor $\frac{1}{4}$.

Exercise 3 - Dilate a triangle



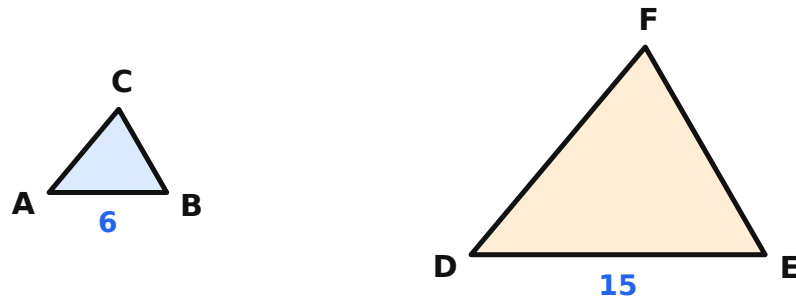
Triangle ABC.

Triangle ABC has A(1, 1), B(3, 1) and C(1, 4). Dilate it with center at the origin and scale factor 2. Give the image vertices.

Exercise 4 - Shrinking a poster

A dilation shrinks a poster that is 24 inches wide to an image that is 9 inches wide. State the scale factor as a decimal, then give the height of the image when the original poster is 40 inches tall.

Exercise 5 - Find the scale factor



Triangle ABC and its image.

Side AB measures 6 and its image $A'B'$ measures 15. Find the scale factor of the dilation.

Exercise 6 - Enlargement or reduction?

Tell whether each scale factor gives an enlargement, a reduction, or a congruent image: 1.4, 0.6, 1.

Exercise 7 - Different center

Dilate $P(4,3)$ with center $C(1,1)$ and scale factor 2.

Exercise 8 - Reduction about a center

Dilate $A(5,6)$ with center $P(2,3)$ and scale factor $\frac{1}{3}$.

Exercise 9 - Image of a line



A line not through the center maps to a parallel line.

The line $y = 2x + 3$ is dilated with center at the origin and scale factor 3. Find an equation of the image.

Exercise 10 - Line through the center

The line $y = x$ is dilated with center at the origin and scale factor 4. Describe the image.

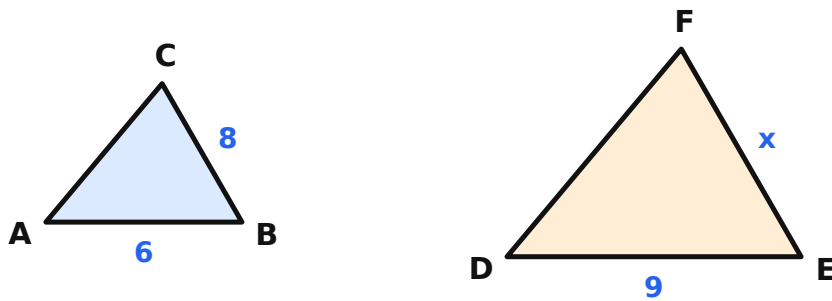
Exercise 11 - Angles are preserved

Triangle ABC has $m\angle A = 50^\circ$. It is dilated by a scale factor of 2.5 to give $A'B'C'$. Find $m\angle A'$ and the ratio $\frac{A'B'}{AB}$.

Exercise 12 - AA similarity

Triangle 1 has angles of 50° and 60° . Triangle 2 has angles of 70° and 60° . Are the triangles similar? Explain.

Exercise 13 - Missing side



Triangle ABC is similar to triangle DEF.

Triangle ABC is similar to triangle DEF. $AB = 6$, $DE = 9$ and $BC = 8$. Find EF.

Exercise 14 - Area under dilation

A triangle has area 10 square units. Find the area of its image under a dilation with scale factor 3.

Exercise 15 - Perimeter under dilation

A triangle has a perimeter of 24 cm. Find the perimeter and the area ratio for a similar triangle with scale factor 1.5.

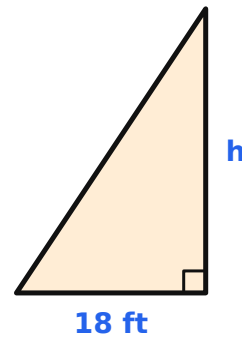
Exercise 16 - Third angle by AA

Triangle ABC has $m\angle A = 48^\circ$ and $m\angle B = 62^\circ$. Triangle DEF has $m\angle D = 48^\circ$ and $m\angle E = 62^\circ$. Show the triangles are similar and find $m\angle C$ and $m\angle F$.

Exercise 17 - Dilation then reflection

Triangle ABC has $A(1, 1)$, $B(3, 1)$ and $C(1, 4)$. It is dilated by scale factor 2 about the origin and then reflected across the y-axis. Find A'' , B'' and C'' and explain why the final triangle is similar to ABC.

Exercise 18 - Shadow problem



Similar right triangles.

Diego is 6 feet tall and casts a 4-foot shadow. At the same time a tree casts an 18-foot shadow. Find the height of the tree.

Exercise 19 - Photo enlargement

A 4-inch by 6-inch photo is enlarged with scale factor 2.5. Find the new dimensions and the ratio of the new area to the original area.

Exercise 20 - Model car

A toy model is built at scale 1 : 18. The real car is 15 feet long. Find the model length in inches.