

Geometry - Dilations and Similarity - Quiz

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

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

Test your understanding of dilations and similarity with this 10-question multiple-choice quiz. Each question has one correct answer, and the explanation after it names the typical mistake behind the wrong choices. Take it after the lesson or before the test.

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

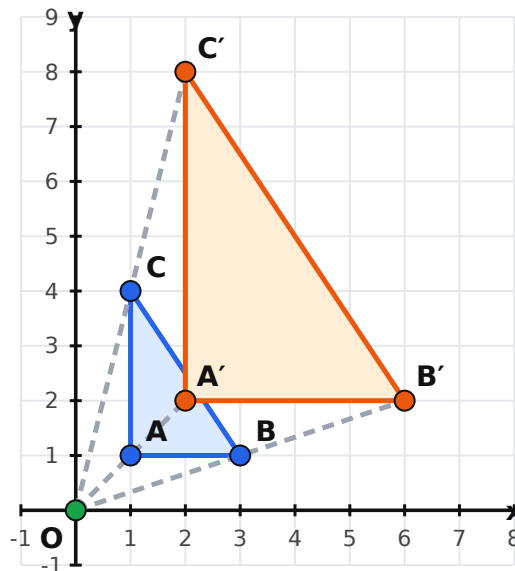
Questions

Question 1

A dilation with center at the origin and scale factor 4 maps $(2, -3)$ to

- A. $(6, 1)$
- B. $(-8, 12)$
- C. $(8, -12)$
- D. $(0.5, -0.75)$

Question 2



Dilation with center O and scale factor 2: every distance from O doubles.

The dilation shown maps triangle ABC to A'B'C'. What is the scale factor?

- A. $\frac{1}{2}$
- B. 3
- C. 2
- D. 4

Question 3

Which quantity is NOT preserved by a dilation with scale factor 3?

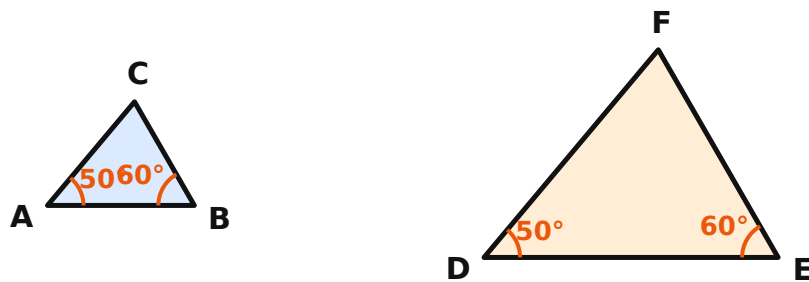
- A. Angle measure
- B. Length
- C. Parallelism of lines
- D. Whether a line through the center stays on itself

Question 4

A triangle has area 12. A dilation with scale factor 5 gives a triangle of area

- A. 300
- B. 60
- C. 17
- D. 120

Question 5



Which similarity criterion applies to the triangles with the labeled angles?

- A. SSS
- B. SAS
- C. ASA
- D. AA

Question 6

Triangles are similar with sides 5, 7, 9 and 15, 21, x . What is x ?

- A. 11

- B. 27
- C. 30
- D. 45

Question 7

A dilation with scale factor $\frac{1}{2}$ and center $(0, 0)$ maps $(10, -6)$ to

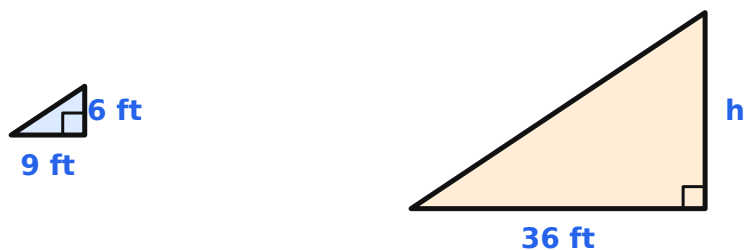
- A. $(5, -3)$
- B. $(20, -12)$
- C. $(-5, 3)$
- D. $(5, 3)$

Question 8

The image of the line $y = -x + 4$ under a dilation with scale factor 2 about the origin is a line with slope

- A. -1
- B. -2
- C. 1
- D. 2

Question 9



A 6-foot pole casts a 9-foot shadow. A tree casts a 36-foot shadow. How tall is the tree?

- A. 54 feet
- B. 30 feet
- C. 4 feet
- D. 24 feet

Question 10

Dilate $(4, 3)$ with center $(1, 1)$ and scale factor 2. What is the image?

- A. $(8, 6)$

- B. (7, 5)
- C. (5, 4)
- D. (10, 7)

Answers

1. **C** – Multiply both coordinates by 4. Dividing by 4 would be a scale factor of $1/4$.
2. **C** – Image vertex (2, 2) is twice (1, 1), so the scale factor is 2.
3. **B** – Lengths are multiplied by 3. Angle measures and parallelism are preserved.
4. **A** – Area is multiplied by 5 squared, which is 25: $12 \times 25 = 300$. Multiplying by 5 gives 60.
5. **D** – Two pairs of congruent angles prove similarity by AA.
6. **B** – The scale factor is $15/5 = 3$, so $x = 3 \times 9 = 27$. Adding 2 each time would not keep the shape.
7. **A** – Halve each coordinate. Changing signs would be a rotation or reflection.
8. **A** – The image is parallel to the original line, so it has the same slope, -1.
9. **D** – The ratio height/shadow is $6/9 = 2/3$, so $36 \times 2/3 = 24$. Multiplying by $9/6$ gives 54, which flips the ratio.
10. **B** – The vector from the center is (3, 2). Doubled it is (6, 4). Add the center to get (7, 5). Using the origin as center gives (8, 6).

Remember

- A dilation multiplies lengths by the scale factor k ; with center at the origin, (x, y) goes to (kx, ky) .
- Dilations preserve angle measure and send lines to parallel lines.
- Area is multiplied by k squared and perimeter by k .
- A line through the center of dilation maps to itself.
- AA: two congruent angle pairs prove triangles similar.