

Geometry · Dilations and Similarity Transformations · Quiz

Common Core G-SRT.A.1, G-SRT.A.2, G-SRT.A.3 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

Ten multiple-choice questions check scale factor, dilations on the coordinate plane, lines under dilation and the AA criterion. Pick the single best answer for each question, then read the explanation to learn the typical mistake.

GeometryCommon Core: G-SRT.A.1 · G-SRT.A.2 · G-SRT.A.3

Questions

Question 1

Which statement is true for every dilation?

- A. Every point moves the same distance
- B. Every point stays the same distance from the center
- C. Every point moves to the other side of a line
- D. The center does not move

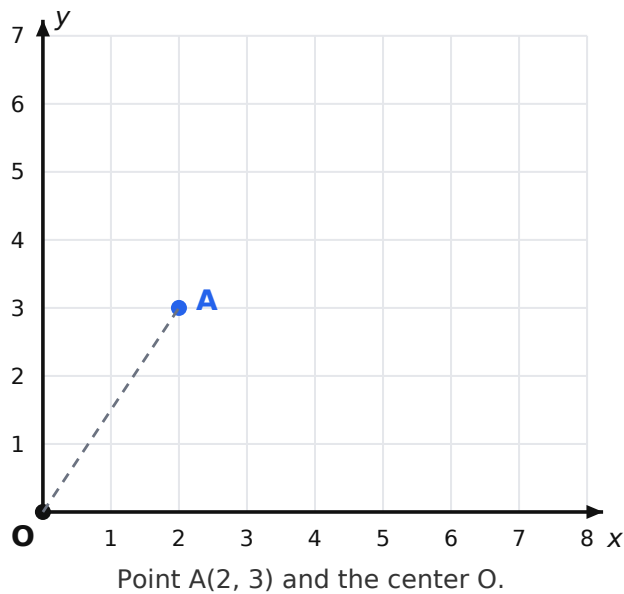
Question 2

A dilation with center O maps P to P' . $OP = 4$ in. and $OP' = 10$ in. What is the scale factor?

- A. $\frac{2}{5}$
- B. $\frac{5}{2}$
- C. 6
- D. $\frac{7}{2}$

Question 3

Point A is dilated about the origin O with scale factor 2. What are the coordinates of A' ?



- A. (4,6)
- B. (4,5)
- C. (1,1.5)
- D. (6,9)

Question 4

Which scale factor produces a reduction?

- A. $\frac{4}{3}$
- B. $\frac{3}{4}$
- C. 1
- D. $\frac{7}{6}$

Question 5

A dilation about the origin has scale factor 3. What is the image of the line $y = 2x - 6$?

- A. $y = 6x - 18$
- B. $y = 2x - 2$
- C. $y = 2x - 18$
- D. $y = 2x - 6$

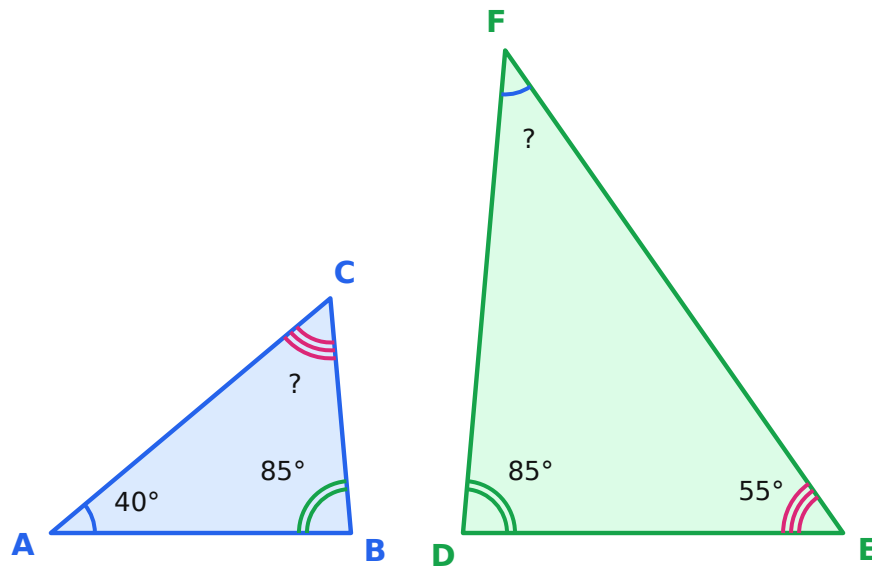
Question 6

A 12 cm segment is dilated with scale factor $\frac{5}{6}$. How long is the image?

- A. 14.4 cm
- B. 10 cm
- C. 12 cm
- D. 17 cm

Question 7

Are the two triangles similar?



Two angles are marked in each triangle.

- A. No, only one angle pair matches
- B. No, side lengths are needed
- C. No, the triangles face different ways
- D. Yes, both have angles 40, 55 and 85 degrees

Question 8

A triangle with a 72° angle is dilated with scale factor $\frac{1}{4}$. What is the measure of the matching image angle?

- A. 18 degrees
- B. 288 degrees
- C. 72 degrees
- D. 36 degrees

Question 9

A dilation has center $C(1,1)$ and scale factor 2. What is the image of $P(4,3)$?

- A. (7,5)
- B. (8,6)
- C. (9,7)
- D. (2.5,2)

Question 10

In the figure, $OA = 3$ and $AA' = 6$. What is the scale factor of the dilation with center O?



A dilation with center O maps A to A'.

- A. 3
- B. 2
- C. 9
- D. $\frac{1}{3}$

Answer key

1. **D** – A dilation moves each point along its ray from the center and leaves the center fixed. The other choices describe a translation, a rotation and a reflection.
2. **B** – The scale factor is image distance over original distance: 10 divided by 4 is $5/2$. Inverting the ratio gives $2/5$, and subtracting gives 6.
3. **A** – Multiply both coordinates by 2: (2, 3) becomes (4, 6). Adding 2 gives (4, 5), and dividing by 2 gives (1, 1.5).
4. **B** – A reduction needs a scale factor between 0 and 1. The factors $4/3$ and $7/6$ enlarge, and 1 leaves the size unchanged.
5. **C** – The image is a parallel line with slope 2 and intercept 3 times -6, which is -18. The line stays put only if it passes through the center.
6. **B** – Multiply by the scale factor: 12 times $5/6$ is 10. Dividing by $5/6$ gives 14.4, and adding 5 gives 17.
7. **D** – The third angles are 55 and 40 degrees, so each triangle has angles 40, 55 and 85. Two matching pairs already prove similarity by AA, and no side lengths are required.
8. **C** – Dilations preserve angle measure, so the angle is still 72 degrees. Only lengths are multiplied by the scale factor.
9. **A** – From C to P is 3 right and 2 up. Doubled, that is 6 right and 4 up from C, which gives (7, 5). Using the origin as center gives (8, 6).
10. **A** – The distance from the center to the image is $OA' = 3 + 6 = 9$, so $k = 9$ divided by $3 = 3$. Using $AA' = 6$ directly gives the common wrong answer 2.

Remember:

- A dilation needs a center and a positive scale factor k ; the center never moves (G-SRT.A.1).
- A line through the center maps to itself; any other line maps to a parallel line, and every segment is multiplied by k .
- About the origin, a dilation is (x, y) to (kx, ky) ; angle measures stay the same.
- Figures are similar when a sequence of rigid motions and dilations maps one onto the other (G-SRT.A.2).
- AA criterion: two pairs of congruent angles are enough to prove triangles similar (G-SRT.A.3).