

Grade 8 · Congruence, Dilations and Similarity

· Quiz

Common Core 8.G.A.2, 8.G.A.3, 8.G.A.4 · mathovore.fr

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

Ten multiple-choice questions check rigid motions, coordinate rules, dilations and similar figures. Each question has exactly one correct answer. Read the explanation after each choice to learn the typical mistake.

Grade 8 Common Core: 8.G.A.2 · 8.G.A.3 · 8.G.A.4

Questions

Question 1

Which transformation produces an image that is NOT congruent to the original figure?

- A. A reflection across the x -axis
- B. A rotation of 90° about the origin
- C. A translation 3 units left
- D. A dilation with scale factor 2

Question 2

Which rule describes a reflection across the y -axis?

- A. $(x,y) \rightarrow (x,-y)$
- B. $(x,y) \rightarrow (-x,-y)$
- C. $(x,y) \rightarrow (-x,y)$
- D. $(x,y) \rightarrow (y,x)$

Question 3

What is the image of $(3,-1)$ after a 90° counterclockwise rotation about the origin?

- A. $(-1,-3)$
- B. $(-3,1)$
- C. $(-1,3)$
- D. $(1,3)$

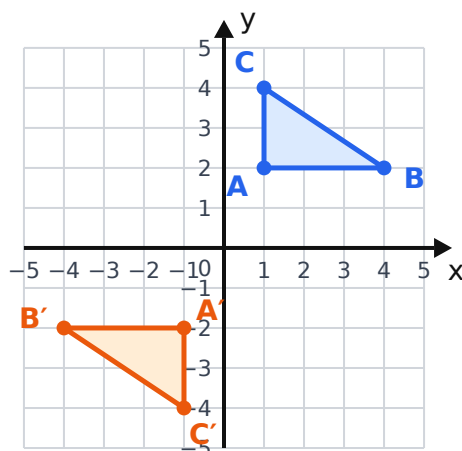
Question 4

A dilation about the origin has scale factor $\frac{1}{2}$. What is the image of $(6,-4)$?

- A. $(3, -2)$
- B. $(12, -8)$
- C. $(3, -4)$
- D. $(-3, 2)$

Question 5

Which single transformation maps triangle ABC onto triangle $A'B'C'$?



Triangle ABC and its image.

- A. A reflection across the x -axis
- B. A reflection across the y -axis
- C. A translation 5 units left and 6 units down
- D. A rotation of 180° about the origin

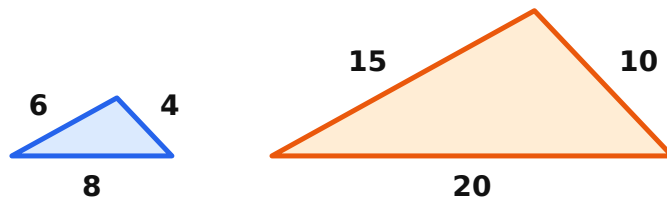
Question 6

A triangle is dilated with scale factor 3. Which quantity stays the same?

- A. Each side length
- B. Each angle measure
- C. The perimeter
- D. The distance from each vertex to the origin

Question 7

The two triangles are similar. What is the scale factor from the small triangle to the large one?



The two triangles, drawn to scale.

- A. $\frac{15}{6}$
- B. $\frac{10}{4}$
- C. $\frac{20}{8}$
- D. $\frac{15}{10}$

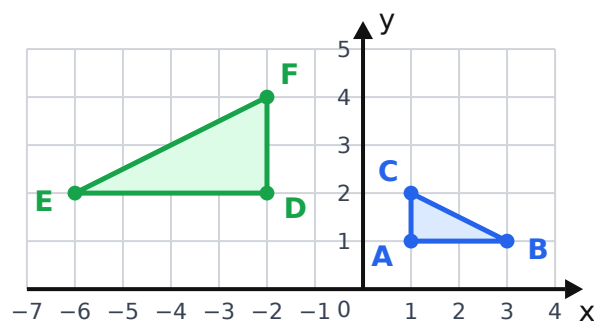
Question 8

Which pair of rectangles is similar?

- A. 3 in by 5 in and 6 in by 8 in
- B. 4 in by 6 in and 7 in by 9 in
- C. 3 in by 5 in and 9 in by 15 in
- D. 2 in by 3 in and 4 in by 7 in

Question 9

Which sequence maps triangle ABC onto triangle DEF ?



Triangles ABC and DEF .

- A. Dilate by 2, then reflect across the y -axis
- B. Dilate by 2, then reflect across the x -axis
- C. Dilate by $\frac{1}{2}$, then reflect across the y -axis
- D. Translate 3 units left and 1 unit up

Question 10

Which statement correctly defines congruent figures?

- A. The figures have the same shape but may have different sizes
- B. One figure can be mapped onto the other by a sequence of rotations, reflections and translations
- C. One figure is a dilation of the other with scale factor 2
- D. The figures have the same area but may have different shapes

Answer key

1. **D** - A dilation with $k=2$ doubles every length. Reflections, rotations and translations are rigid motions, so they always give congruent figures.
2. **C** - Across the y -axis the x -coordinate changes sign. Changing the sign of y is a reflection across the x -axis.
3. **D** - Use $(x,y) \rightarrow (-y,x)$: $(3,-1) \rightarrow (1,3)$. The point $(-1,-3)$ comes from rotating clockwise instead.
4. **A** - Multiply both coordinates by $\frac{1}{2}$. Changing only x gives $(3,-4)$, and multiplying by 2 enlarges the figure.
5. **D** - Each point goes to $(-x,-y)$, the 180° rotation rule. A single reflection changes only one sign.
6. **B** - Dilations multiply lengths and distances from the origin by 3, but angle measures do not change.
7. **A** - Divide matching sides: $10 \div 4 = \frac{5}{2}$, $15 \div 6 = \frac{5}{2}$, $20 \div 8 = \frac{5}{2}$. The reciprocal $\frac{2}{5}$ goes from large to small.
8. **C** - Both sides are tripled: $9 \div 3 = 3$ and $15 \div 5 = 3$. Adding the same amount to each side, as in 4 by 6 and 7 by 9, does not keep the shape.
9. **A** - Dilating gives $(2,2)$, $(6,2)$, $(2,4)$; reflecting across the y -axis gives $(-2,2)$, $(-6,2)$, $(-2,4)$. The x -axis reflection flips the y -values instead.
10. **B** - Congruence uses rigid motions only. The other statements describe similarity, a dilation with $k=2$ and equal area.

Remember:

- Standards 8.G.A.2, 8.G.A.3 and 8.G.A.4: congruence, coordinates under transformations, and similarity.
- Rigid motions (translation, reflection, rotation) keep lengths and angle measures.
- Dilation about the origin: $(x,y) \rightarrow (kx,ky)$; lengths scale by k , angles do not change.
- Similar figures: a sequence of rigid motions and dilations maps one onto the other.
- Rotation rules about the origin: 90° is $(-y,x)$, 180° is $(-x,-y)$, 270° is $(y,-x)$.