

# Similarity

Scale factor, proportional reasoning, dilation, and similar-triangle structure.

Name \_\_\_\_\_ Date \_\_\_\_\_

32 main 2-up grid 11 pages visible side quests

## Completion Reward



Shown here as a small pack artifact, not a preview destination.

### 1. What do similar figures preserve?

- A. Exact side lengths only
- B. Perimeter only
- C. Area only
- D. Angle measures and side-length ratios

### 1.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

### 1.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

### 1.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

### 1.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

### 1.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

### 2. If the scale factor between two similar figures is 3, how does area change?

- A. By a factor of 3
- B. By a factor of 9
- C. By a factor of 6
- D. It stays the same

### 2.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

### 2.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

### 2.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

### 2.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

### 2.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

### 3. Which statement describes similar figures?

- A. They have equal corresponding sides only.
- B. They have equal corresponding angles and proportional corresponding sides.
- C. They must have the same area.
- D. They must be the same size.

### 3.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

### 3.2. A reflection creates:

- A. A larger copy
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### 3.3. A rotation turns a figure around:

- A. a mirror line
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### 3.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

### 3.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

**4. Which information is enough to prove two triangles are similar?**

- A. Three pairs of corresponding sides are equal.
- B. One side length is equal.
- C. Two pairs of corresponding angles are congruent.
- D. One angle is a right angle.

4.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

**5. How is congruence related to similarity?**

- A. Congruent figures are never similar.
- B. Congruent figures are similar with scale factor 1.
- C. Similar figures always have different sizes.
- D. Similarity only applies to circles.

5.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

**6. What is the key difference between similar and congruent figures?**

- A. Congruent figures can have different shapes.
- B. Similar figures must have equal area.
- C. Similar figures can have different sizes.
- D. Congruent figures cannot be rotated.

6.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

4.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

4.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

5.1. A translation does what?

- A. Turns a figure
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- A. A larger copy
- B. A mirror image
- C. A rotated copy only
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- A. equal area only
- B. the same shape with proportional side lengths
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- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

6.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

7. If triangle ABC is similar to triangle DEF, which angle corresponds to angle B?

- A. Angle E
- B. Angle D
- C. Angle F
- D. Angle A

7.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

8. If two angles of one triangle match two angles of another triangle, what can you conclude?

- A. The triangles are congruent by AAA.
- B. The triangles are similar by AA.
- C. The triangles are perpendicular.
- D. Nothing can be concluded.

8.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

9. A point moves from (2, 3) to (6, 9) under a dilation centered at the origin. What is the scale factor? Answer with a number.

9.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

7.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

7.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

8.1. A translation does what?

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- A. Turns a figure
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- C. Resizes a figure
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- A. the same shape only
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- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

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- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

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- C. the same size only
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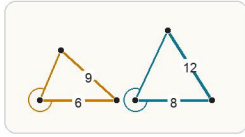
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- C. A rotated copy only
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9.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

10. The smaller triangle has a corresponding side of 6 and the larger triangle has the matching side 8. What is the scale factor from smaller to larger?



In similar triangles, the scale factor comes from the ratio of corresponding side lengths.

- A.  $\frac{4}{3}$
- B.  $\frac{3}{4}$
- C. 2
- D. 14

10.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

11. If two triangles already have two matching angle pairs, what is the best next conclusion?

- A. The triangles are congruent.
- B. The triangles are similar.
- C. The triangles are perpendicular.
- D. The triangles have equal area.

11.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

12. You know two triangles are similar and want to find a missing side. What should you do next?

- A. Write a proportion using corresponding side lengths.
- B. Add the side lengths together.
- C. Multiply all the side lengths by 2.
- D. Assume the triangles are congruent.

12.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

10.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

10.4. Congruent figures have:

- A. the same shape only
- B. the same size only
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12.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

12.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
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10.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

10.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

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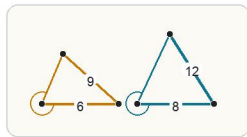
**13. Two triangles are formed by a segment parallel to one side of a larger triangle. What is the best next step toward proving the triangles similar?**

- A. Show pairs of corresponding angles are congruent.
- B. Show all three sides are equal.
- C. Show the perimeters are the same.
- D. Show the areas are equal.

13.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

**14. A student says a side length goes from 6 to 8 by adding 2, so every other side should also just add 2. What is the mistake?**



Corresponding sides in similar figures scale by a common ratio, so adding a fixed number to each side is not the right model.

- A. Adding 2 always works for similar figures.
- B. You should subtract 2 instead of add 2.
- C. Only angles may change under similarity.
- D. Similarity uses multiplication by a scale factor, not adding the same amount.

14.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

**15. A student says a side changes from 6 to 10 by a scale factor of 4 because  $10 - 6 = 4$ . What is the mistake?**

- A. Scale factors only use angles.
- B. The factor should always be greater than 10.
- C. The student should divide 6 by 10 and stop.
- D. Scale factors are multiplicative, not additive.

15.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

13.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

13.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

14.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

14.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

15.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

15.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

13.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

13.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

14.2. A reflection creates:

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- C. A rotated copy only
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- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

15.2. A reflection creates:

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- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

15.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

**16. A student writes a proportion using one shortest side and one longest side as if they correspond. What is the likely problem?**

- A. The student should add the side lengths.
- B. The triangles must be congruent instead.
- C. The student mismatched corresponding sides.
- D. The scale factor must be 1.

16.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

**17. A figure is reduced by scale factor  $\frac{1}{2}$ . If a side was 18, what is the new side length? Answer with a number.**

17.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

**18. If two pairs of corresponding sides are proportional and the included angle matches, what theorem applies?**

- A. SSS congruence
- B. SAS similarity
- C. HL
- D. CPCTC

18.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

16.1. A translation does what?

- A. Turns a figure
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- C. Resizes a figure
- D. Flips a figure

16.4. Congruent figures have:

- A. the same shape only
- B. the same size only
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17.1. A translation does what?

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- C. Resizes a figure
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17.4. Congruent figures have:

- A. the same shape only
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18.1. A translation does what?

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16.2. A reflection creates:

- A. A larger copy
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- C. A rotated copy only
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16.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

17.2. A reflection creates:

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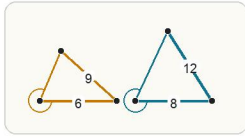
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- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

19. What is the most important first step when solving with similar triangles?



Before solving, identify which sides and angles correspond so the scale factor is built from the right pair.

- A. Add all the side lengths immediately.
- B. Match corresponding sides before writing a proportion.
- C. Assume the triangles are congruent.
- D. Square both side lengths.

19.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

20. A student says a scale factor of 2 makes area double. What is the error?

- A. Area never changes under similarity.
- B. Area scales by the square of the scale factor, so it should quadruple.
- C. Area should be halved instead.
- D. Only perimeter changes under similarity.

20.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

21. Two similar triangles have corresponding sides 4 and 10. If the side corresponding to 10 is  $x$  in the smaller triangle, and the matching larger side is 25, what is  $x$ ? Answer with a number.

21.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

19.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

19.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

20.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

20.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

21.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

21.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

19.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

19.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

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- A. A larger copy
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20.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
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- D. parallel sides only

21.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

21.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

**22. A triangle has perimeter 18. A similar triangle is made with scale factor  $\frac{4}{3}$ . What is the new perimeter? Answer with a number.**

22.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

22.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

22.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

22.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

22.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

**23. A similar figure uses a scale factor of  $\frac{3}{2}$ . If the original side length is 8, what is the image side length? Answer with a number.**

23.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

23.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

23.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

23.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

23.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

**24. A similar figure uses scale factor 1.5. If the original perimeter is 14, what is the new perimeter? Answer with a number.**

24.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

24.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

24.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

24.4. Congruent figures have:

- A. the same shape only
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- C. the same shape and size
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24.5. Similar figures have:

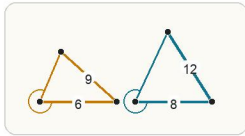
- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

25. Solve for  $x$ :  $4/6 = x/9$  Answer with a number.

25.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

26. In similar triangles, one pair of corresponding sides is 6 and 8. If another side on the smaller triangle is 9, what is the matching side on the larger triangle? Answer with a number.



Once the side ratio is known, apply that same scale factor to the corresponding side length.

26.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

27. A small model tower is 6 inches tall. A similar real tower is 15 feet tall. What is the scale factor from model to real tower if you convert 15 feet to 180 inches first? Answer with a number.

27.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

25.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

25.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

26.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

26.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
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27.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

27.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

25.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

25.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

26.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

26.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

27.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

27.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

28. Solve for  $x$ :  $6/9 = 10/x$  Answer with a number.

28.3. A rotation turns a figure around:

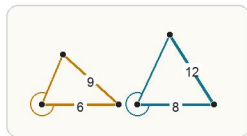
- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

29. A figure with area 9 is dilated by scale factor 2. What is the new area? Answer with a number.

29.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

30. Which proportion keeps corresponding sides in the correct order if 6 matches 8 and 9 matches  $x$ ?



Similar triangles keep angle measures while corresponding side lengths scale by the same factor.

- A.  $6/8 = 9/x$
- B.  $6/9 = 8/x$
- C.  $6/8 = x/9$
- D.  $8/6 = 9/x$  and  $6/8 = 9/x$  are both impossible

30.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

28.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

28.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

29.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

29.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

30.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

30.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

28.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

28.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

29.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

29.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

30.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

30.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

**31. Student A solves  $4/6 = x/9$  by cross multiplying to get  $6x = 36$ . Student B gets  $4x = 54$ . Who is correct?**

- A. Student B
- B. Student A
- C. Both students
- D. Neither student

31.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

**32. Point P is at (2, 1). A dilation centered at the origin uses scale factor 3. Where is P'? Answer as an ordered pair.**

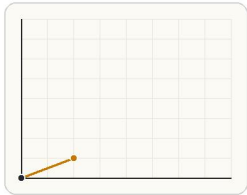


Image coordinates scale away from the origin by the dilation factor.

32.3. A rotation turns a figure around:

- A. a mirror line
- B. a center point
- C. the x-axis only
- D. its longest side

31.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

31.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

32.1. A translation does what?

- A. Turns a figure
- B. Slides a figure
- C. Resizes a figure
- D. Flips a figure

32.4. Congruent figures have:

- A. the same shape only
- B. the same size only
- C. the same shape and size
- D. the same perimeter only

31.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

31.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only

32.2. A reflection creates:

- A. A larger copy
- B. A mirror image
- C. A rotated copy only
- D. A figure with different side lengths

32.5. Similar figures have:

- A. equal area only
- B. the same shape with proportional side lengths
- C. the same size only
- D. parallel sides only