

Check Your Understanding 6.2

Basic

Intermediate

Advanced

Row 1 Spiral — Proportional Reasoning and Scale

→ The engine behind similarity

Basic — Spiral

- Two similar rectangles have widths of 5 and 15. The smaller rectangle has a length of 8. Find the length of the larger rectangle.
- A figure is dilated. The original has a side of length 6. The image has a corresponding side of length 9. What is the scale factor from original to image?

Intermediate — Spiral

- Two similar pentagons $ABCDE \sim A'B'C'D'E'$. $AB = 12$, $A'B' = 8$, and $CD = 15$. Find $C'D'$. Show both the scale factor method and the proportion method.
- In the same similar pentagons, $B'C' = 6$. Find BC .

Advanced — Spiral

- A student solves a missing-length problem using scale factor and gets 18. Another student uses a proportion and gets 14. Both claim to be correct. What error did one of them make? Explain how you would determine which answer is right without re-solving the problem from scratch.

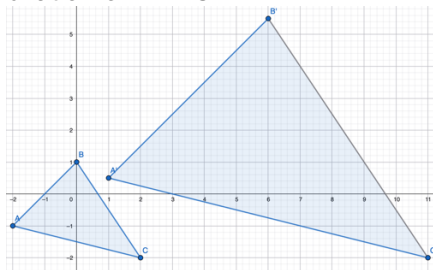
Dilation and Similarity Defined

→ From experience to definition

Basic

- Define dilation in your own words. Include: what stays the same, what changes, and what the center of dilation does.

- In the diagram, $\triangle A'B'C'$ is a dilation of $\triangle ABC$.



Identify the scale factor and write the correct similarity statement.

Intermediate

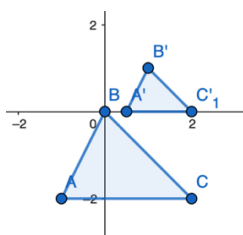
- Triangle ABC has vertices $A(0, 0)$, $B(4, 0)$, $C(0, 3)$. It is dilated from the origin with scale factor 2.5.

(a) Find the coordinates of A' , B' , C' .

(b) Write the similarity statement with correct correspondence.

(c) What invariants does this dilation preserve?

- In the diagram below, is $\triangle A'B'C'$ a dilation of $\triangle ABC$? Show work to justify your answer. If yes, state the scale factor and identify the point of dilation.



Advanced

- A student claims: 'Any transformation that makes a shape larger must be a dilation.' Is this correct? Give an example that supports or refutes the claim, and explain what specifically makes a transformation a dilation.

- Triangle ABC and triangle DEF have all corresponding angles equal and all corresponding sides proportional with ratio 2:3. Explain why the two triangles are similar. Then identify a point of dilation that would map $\triangle ABC$ onto $\triangle DEF$.

Algebra Spiral
Simplify

Algebra Spiral

Simplify each expression completely.

- $3x^2 + 5x - x^2 - 9x$
- $3(4a - 1) - 2(a + 6)$

Answers — CYU 6.2**Row 1 Spiral**

1. Scale factor = $15/5 = 3$. Length = $8 \times 3 = 24$.
2. $9/6 = 3/2$.
3. Scale factor = $8/12 = 2/3$. $C'D' = 15 \times (2/3) = 10$. Proportion: $12/8 = 15/C'D' \rightarrow C'D' = 10$. ✓
4. $BC = B'C' \div (2/3) = 6 \times (3/2) = 9$.
5. One student applied the scale factor in the wrong direction (multiplied instead of divided, or vice versa). To check without re-solving: verify that 18 and 14 are on opposite sides of the original length. The correct answer must be consistent with the direction of the dilation.

Dilation and Similarity Defined

6. A dilation scales a figure from a fixed center point. Angles stay the same; corresponding lengths change by a constant ratio (the scale factor); the center maps to itself.
7. Accept any correct scale factor read from the diagram. Similarity statement must match vertex correspondence.
- 8a. $A'(0,0)$, $B'(10,0)$, $C'(0,7.5)$.
- 8b. $\triangle ABC \sim \triangle A'B'C'$.
- 8c. Angle measures preserved; ratios of corresponding side lengths preserved; shape preserved.
9. Check ratios of all corresponding sides — if all equal the same value, it is a dilation. Lines through corresponding vertices should meet at a single point (center of dilation). Accept diagram-specific answers.
10. Not correct. A stretch in one direction only (e.g., doubling width but not height) makes a shape larger but is not a dilation. A dilation must scale all dimensions by the same factor from a single center point.
11. Equal corresponding angles and proportional sides satisfies the definition of similarity. The point of dilation can be found by connecting corresponding vertices and finding their intersection.

Algebra Spiral

- (a) $2x^2 - 4x$
- (b) $10a - 15$