

Unit 3: Similarity

ADVANCED · SET 2

Name: _____ Date: _____

Solve each problem. Give exact answers using plain-text notation (fractions like $\frac{3}{4}$, coordinate pairs like (3, -4), ratios like 2:3). Show no work; write only the final answer.

1. Point P(6, -9) is dilated about the origin by a scale factor of $\frac{5}{3}$. What are the coordinates of the image P'?

Answer: _____

3. Triangle ABC ~ Triangle DEF by the AA criterion. Side AB = 14 corresponds to DE = 21, and side BC = 18. Find the length of side EF.

Answer: _____

5. Two similar polygons have a scale factor of $\frac{7}{4}$ (larger to smaller). The smaller polygon has perimeter 36. Find the perimeter of the larger polygon.

Answer: _____

7. Under a dilation centered at the origin, a segment of length 45 maps to an image segment of length 27. Find the scale factor as a fraction in lowest terms.

Answer: _____

9. In a right triangle, an altitude to the hypotenuse creates similar triangles. One leg is the geometric mean of the full hypotenuse (25) and the adjacent hypotenuse segment (9). Find the length of that leg.

Answer: _____

2. A dilation has center C(2, 3) and scale factor 4. Point A(5, 7) is dilated. What are the coordinates of the image A'?

Answer: _____

4. Two triangles are similar. In one, a side of length 8 corresponds to a side of length x in the other. A second pair of corresponding sides measures 12 and 33. Find x.

Answer: _____

6. Two similar figures have a scale factor of $\frac{5}{2}$ (larger to smaller). The smaller figure has area 48. Find the area of the larger figure.

Answer: _____

8. In a right triangle, the altitude drawn to the hypotenuse divides it into segments of length 8 and 18. Find the length of that altitude (it is the geometric mean of the two segments).

Answer: _____

10. In triangle ABC, point D is on AB and point E is on AC with DE parallel to BC. AD = 12, DB = 8, and AE = 15. Find the length of EC.

Answer: _____

11. A figure is dilated by a scale factor of $\frac{3}{2}$, and the result is dilated again by a scale factor of $\frac{4}{3}$ (same center). Find the single scale factor equivalent to both dilations combined.

Answer: _____

12. Triangle ABC ~ Triangle PQR. Side AB = 6.4 corresponds to PQ = 16. Side AC = 9. Find the length of PR as a fraction.

Answer: _____