

Accelerated 7 • Unit 2 Worksheet

Scale Drawings, Similarity, and Slope

Name: _____

Date: _____

Part A • Scaled Copies

1. Triangle A has sides 3, 4, 5. Triangle B has sides 7.5, 10, 12.5.

a. Is B a scaled copy of A? If so, what is the scale factor?

b. What is the ratio of the perimeters? Of the areas? Why?

2. A scaled copy of a rectangle has area 25 times the original. What is the scale factor used? Explain.

Part B • Scale Drawings

3. A scale drawing of a soccer field uses a scale of 1 cm : 5 m. The drawing is 22 cm by 14 cm.

a. What are the actual dimensions of the field?

b. What is the actual area? (Be careful — area does NOT scale the same way as length.)

Part C • Dilations and Similarity

4. Triangle PQR has vertices $P(0,0)$, $Q(2,0)$, $R(0,3)$. It is dilated by a factor of 2 centered at the origin, then by a factor of 1.5 centered at P.

a. Find the coordinates of P' , Q' , R' after the first dilation.

b. Find P'' , Q'' , R'' after both dilations.

c. What single dilation would have the same effect? Centered where? With what factor?

5. Two triangles have angles 50° , 60° , 70° . The first has a side of length 4 opposite the 50° angle; the second has a side of length 10 opposite the 50° angle. Are they similar? Congruent? Justify.

Part D • Similar Triangles and Slope

6. Line L passes through $(0, 1)$ and $(3, 7)$. On the SAME line, identify a third point (x_3, y_3) different from these two, and show how similar triangles on the line guarantee the same slope between any two points.

My third point: (____ , ____)

Why the slope is the same between any two points (use similar triangles):

7. Find the slope of the line through each pair. Then explain what the slope MEANS in context where useful.

a. (2, 5) and (8, 17) slope = _____

b. (-3, 4) and (5, -4) slope = _____

c. A car traveling 60 mph: pick any two (time, distance) points and find the slope. What are its units?

Part E • Thinking Deeply

8. Andre says: "All circles are similar." Clare says: "All squares are similar, but not all rectangles are." Are either of them right? Justify.

9. A line on a coordinate plane passes through (1, 4) and has slope -3. Find another point on the line and explain how you know it lies on the same line — using either similar triangles OR an equation.

10. A photograph is enlarged by scale factor k . The area of the new photo is 9 times the original.

a. What is k ? _____

b. If the original was a 4 by 3 rectangle, what are the new dimensions?

c. What happens to the diagonal of the photo? By what factor?

11. Two triangles share an angle and have corresponding sides in the ratio 2 : 3. Are they necessarily similar? Sketch a counterexample if not.
