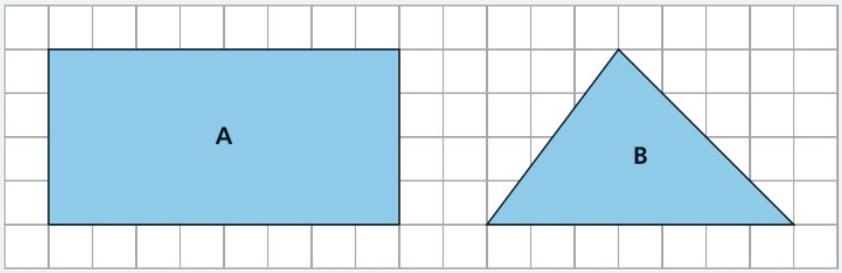
3.3 Designing Under Constraints

Scale Factors and Similar Shapes

The scale factor from one figure to a similar figure gives you information about how the side lengths, perimeters, and areas of the figures are related. In Problem 3.3, you will use what you learned to draw scale drawings.

Problem 3.3

For Questions A and B, use the two figures on the grid.



A For each part, draw a rectangle similar to Rectangle A that fits the given description. Explain your reasoning.

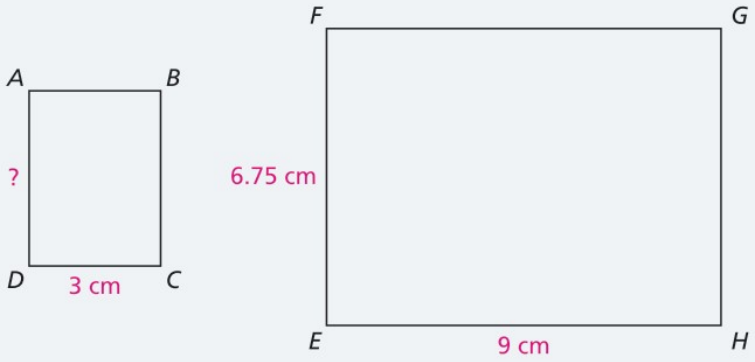
1. The scale factor from Rectangle A to the new rectangle is 2.5.
2. The area of the new rectangle is $\frac{1}{4}$ the area of Rectangle A.
3. The perimeter of the new rectangle is three times the perimeter of Rectangle A.

B For each part, draw a triangle similar to Triangle B that fits the given description. Explain your reasoning.

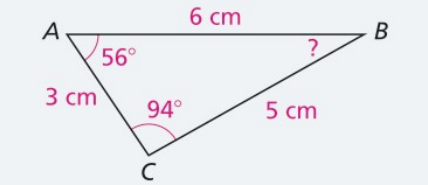
1. The area of the new triangle is 16 times the area of Triangle B.
2. The scale factor from Triangle B to the new triangle is $\frac{1}{2}$.

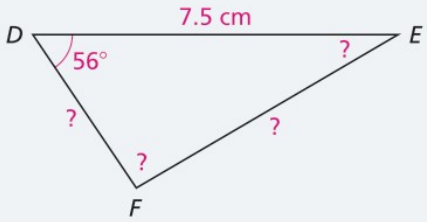
Problem 3.3 continued

C **1.** Rectangles *ABCD* and *EFGH* are similar. Find the length of side *AD*. Explain how you found the length.



2. Triangles *ABC* and *DEF* are similar. Find the missing side lengths and angle measures. Explain.





ACE Homework starts on page 60.