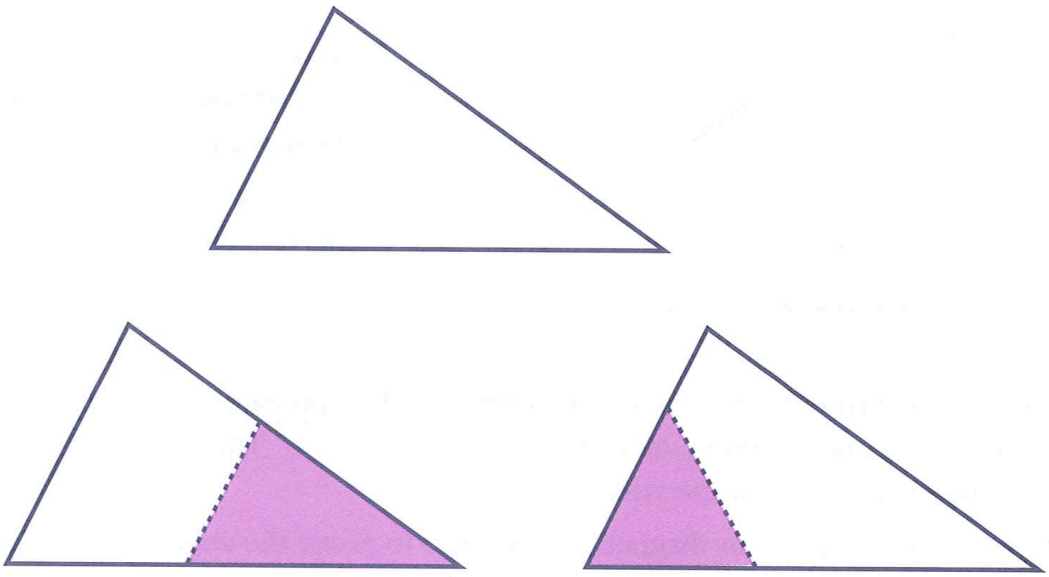
Homework 15 Inside Similarity

How do you make small triangles inside larger ones so that the small ones are similar to the large ones?

The diagram below shows two triangles that are congruent to the top triangle. In each case, a dotted line has been drawn that connects two sides of the triangle and cuts off a smaller (shaded) triangle.



In the first case, the smaller triangle appears to be similar to the larger one. In the second case, the smaller triangle seems not to be similar to the larger one.

Your task is to investigate and report on the difference between these two cases. That is, if you connect points on two sides of a triangle, when does the smaller triangle created in this way come out similar to the original?

You may want to begin your investigation by tracing the original triangle and experimenting by drawing some lines on your tracing. Find as many ways as you can to draw lines to cut off small triangles that are similar to the original triangle.

Then describe in words those lines that can be used to cut off a small triangle that is similar to the larger one, and explain your answer.