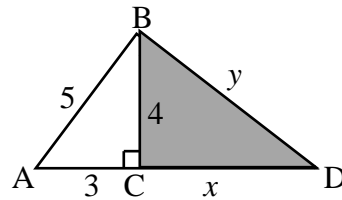


1. Consider the 3-4-5 triangle on the right. Find x and y so that the shaded figure is a gnomon, ie so that the large triangle ABD is geometrically similar to the original triangle ABC.



2. You may observed in the previous question that the gnomon is geometrically similar to the original triangle. In fact the gnomon for all right angle triangles is geometrically similar to the original triangle. Using this fact, or otherwise, find a triangle which is its own gnomon.

3. We have discussed the golden rectangle which is the unique rectangle which had a square as a gnomon. The analogous situation for triangles might be to consider a triangle which had an equilateral triangle as a gnomon. However, it turns out that an equilateral triangle cannot be a gnomon of another triangle. Can you show this geometrically?

Instead let's consider isosceles triangles. There is a unique isosceles triangle that has as its gnomon another isosceles triangle. Triangle ABC with unknown side x and angle θ is shown below with its gnomon BCD. Both are isosceles triangles. Find x and θ and hence determine all angles in the triangle. This triangle is called the golden triangle.

