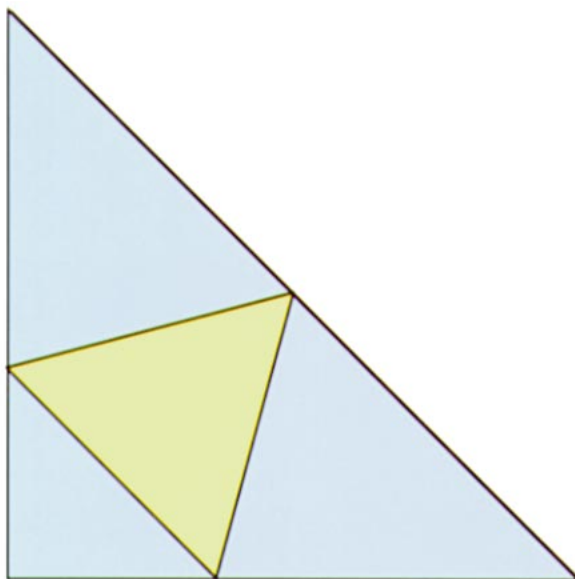


## Two Tricky Triangles

## Problem-of-the-Week

### The Problem

The large triangle is a right isosceles triangle with hypotenuse of length 24. Inside is an equilateral triangle with a vertex on the midpoint of the hypotenuse. If the length of each side of the equilateral triangle is  $k(\sqrt{3} - 1)$ , find  $k$ .



### Strategies and Hints

1. Connect the vertices of the equilateral triangle with the vertices of the large triangle. One of these segments has a length that is easy to determine. Which segment?
2. Use  $x = k(\sqrt{3} - 1)$  to label each side of the equilateral triangle. What is its altitude in terms of  $x$ ?
3. The perpendicular distance from the equilateral triangle to the right angle will also help in the solution. What is the distance in terms of  $x$ ?
4. It would be relatively easy to find the lengths of the legs of the right isosceles triangle. (How would you do this?) However, these lengths are not involved in the solution.