Sharpest Triangles, An Introduction

The previous chapter examined a very specific version of sharpest triangles, *sharpest apex isosceles triangles on odd polygonal vertices*. In this chapter we relax these assumptions in various ways, all the while maintaining the sharpest triangle assumption so that we are not forced to search for internal sharpest angles.

First, we examine what happens when n is even, and we look at the closest cousin to the sharpest apex isosceles triangles. The result is "largest" sharpest triangles on even vertices which is more easily described by a different name: Sharpest Right Triangles on Even Polygonal Vertices. In this situation, there are two distinct versions of such images, unlike the sharpest isosceles triangles on odd polygons version.

We next examine more explicitly by what we mean when we say this is a *largest large triangles image* as opposed to a *smallest large triangles image* since the first sounds redundant and the second sounds like an oxymoron. In the process, we see what second smallest and second largest look like as well.

Armed with these concepts, we can attack a general answer to the question how many triangles are in an image given a specific rule for creating three non-parallel lines, two of which create a sharpest angle triangle using vertices of an n-gon. We can answer this for general n instead of being forced to focus separately on even or odd n.