

Difficulty: 0/4 **Interest:** 1/4

Consider triangles with vertices on grid points and sides of equal length *according to the Taxicab metric*—in particular, those with no smaller, similar triangle.

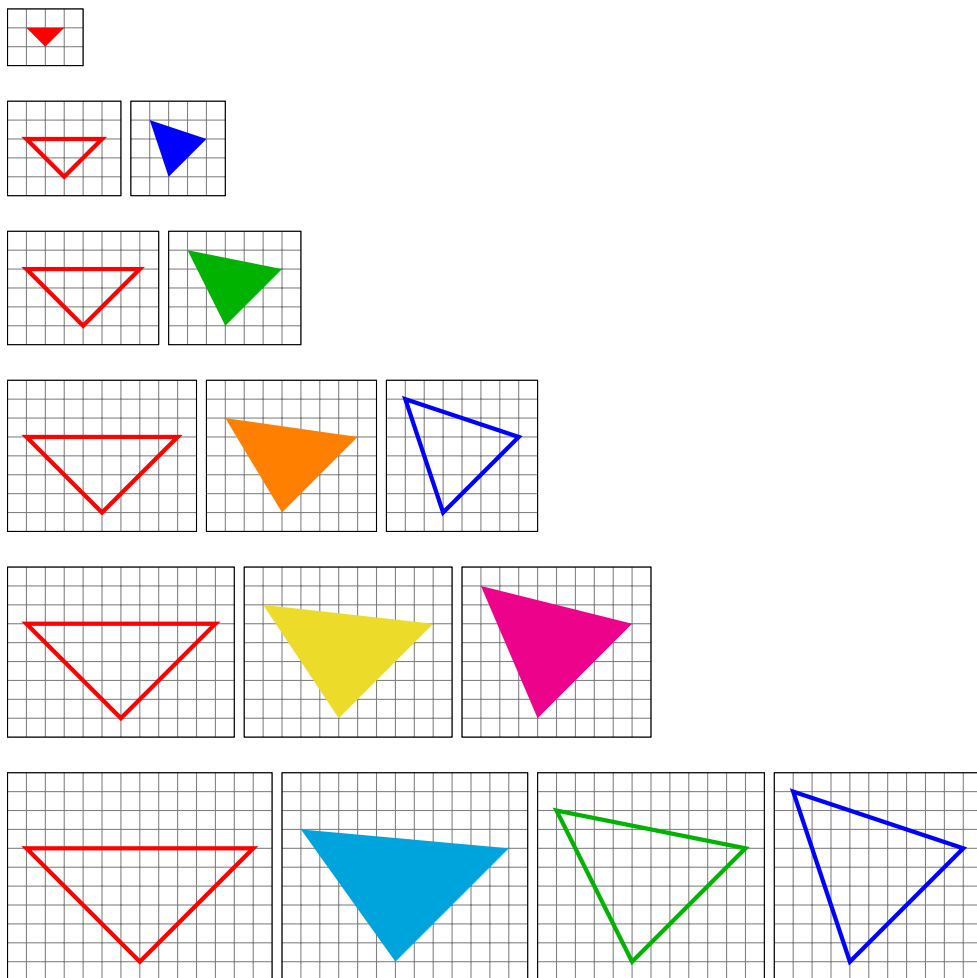


Figure 1: An example of $a(1) = 1$, $a(2) = 1$, $a(3) = 1$, $a(4) = 1$, $a(5) = 2$, and $a(6) = 1$.

Question. How many triangles of side length $2n$ exist?

Note. The answer is probably that $a(1) = 1$ and $a(n) = \lfloor n/2 \rfloor + 1 - \sum_{d|n} a(d)$, which appears to be A023022.

Related.

1. What is the related sequence for triangles measured under the d_∞ metric?
2. How does this generalize to equilateral n -gons? Convex n -gons?
3. How does this generalize to a Taxicab-like metric on a triangular grid?

References.

<http://oeis.org/A023022>