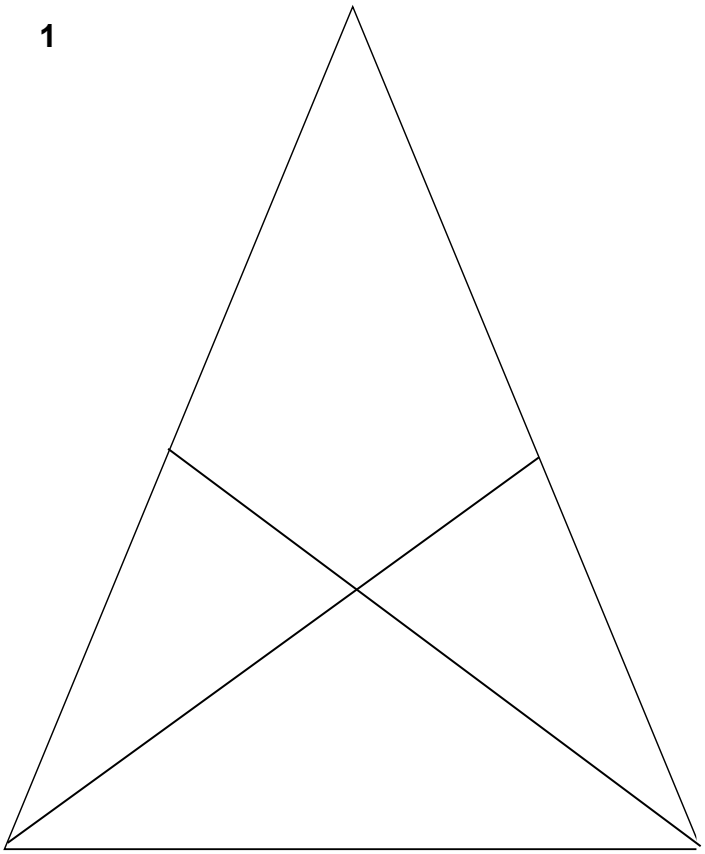
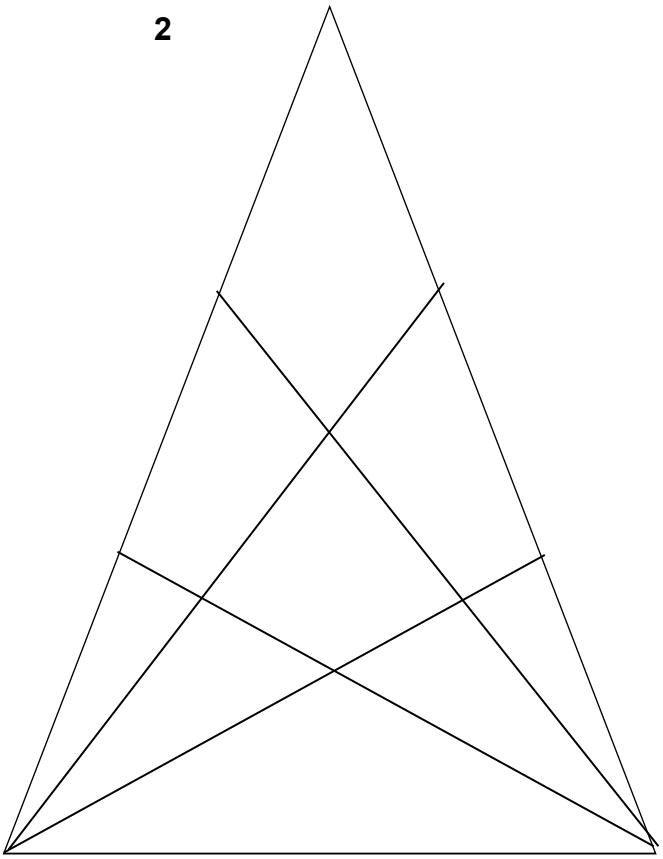
Counting Triangles

How many triangles can you find in each shape? Try to find a way that allows counting and avoids duplication. Can you predict, without counting, the total number of triangles in diagram 4?

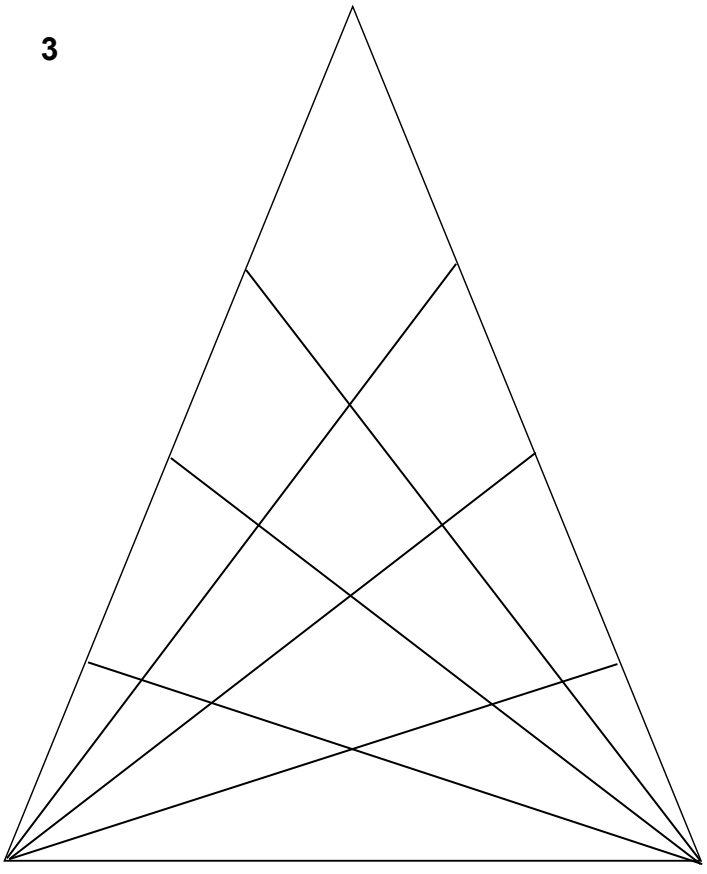
1



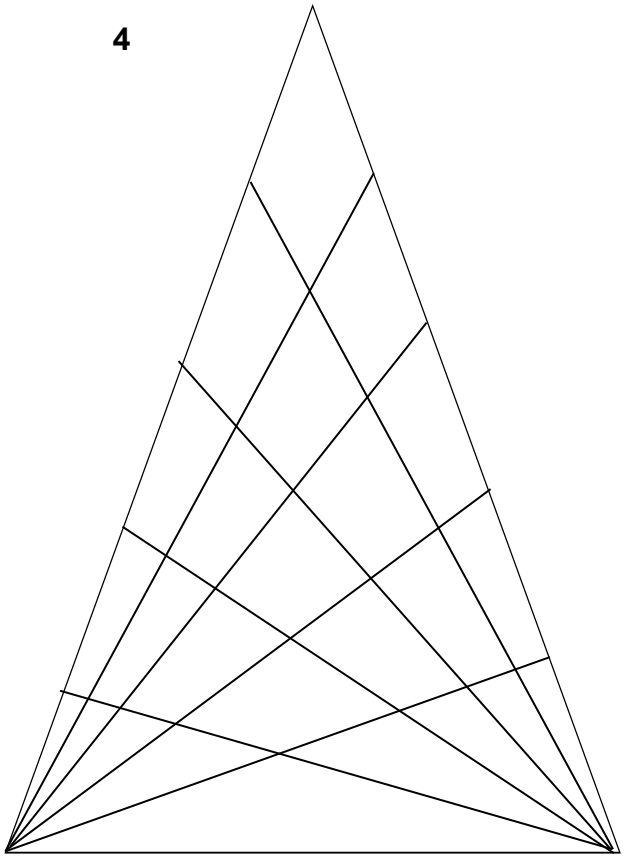
2



3



4

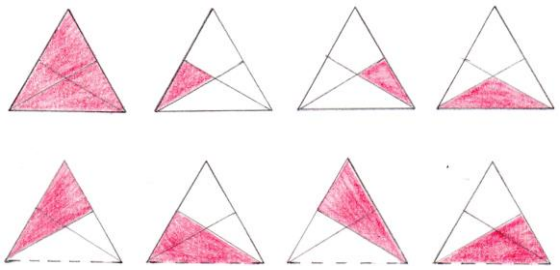


Neil Walker

Counting Triangles (Solution – put at the end)

We label the bottom corner A, the bottom right corner B and the top corner C.

Diagram 1



The number of triangles with:
AB as a base = 4
A as a vertex = 2
B as a vertex = 2
∴ Total number = 8

Diagram 2	**Diagram 3**
The number of triangles with: AB as a base = 9 A as a vertex = 6 (narrow) = 3 (wide) B as a vertex = 6 (narrow) = 3 (wide) ∴ Total number = 27	The number of triangles with: AB as a base = 16 A as a vertex = 24 B as a vertex = 24 ∴ Total number = 64

Diagram 4

125 triangles

Pattern

The total number of triangles in each diagram can be found by counting the number of divisional spaces on one side of the triangle and then cubing the result. Can you see why this works?

So, 2 parts = $2^3 = 8$
3 parts = $3^3 = 27$
4 parts = $4^3 = 64$
5 parts = $5^3 = 125$
6 parts = $6^3 = 216$ …