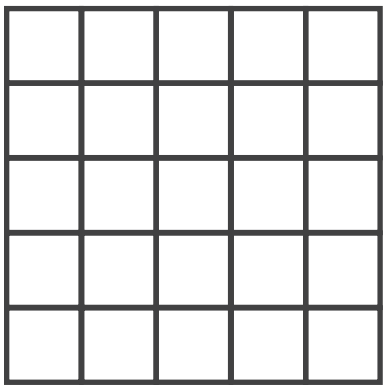
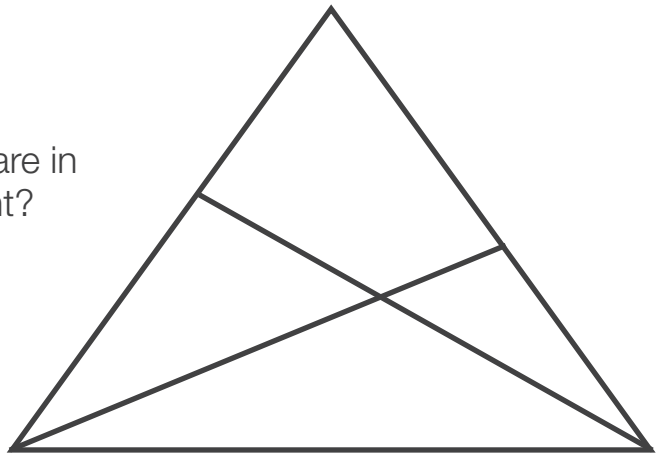
MATH SOLUTION STATION



How many squares are in the shape on the left? Each small box is a square.

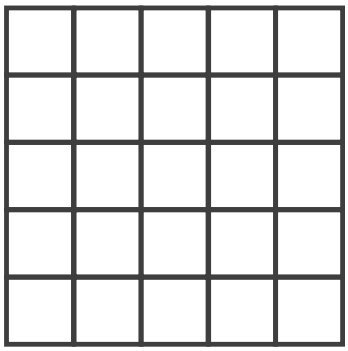
How many triangles are in the shape on the right?



A Mobius strip is made by taking a long strip of paper and connecting the ends with a half-twist; turning it into a surface with only one boundary.

If you gave a strip of paper 2 half-twists, would it result in a surface with only one boundary or two ? How about if you gave it 3 half-twists?

MATH SOLUTION STATION–SOLUTION



How many squares are in the shape on the left? Each small box is a square.

Solution:

Each small 1-by-1 box is square. There are a total of 5 5 = 25 of them.

Each 2-by-2 box is also a square. Starting in the top left, you can get a 2-by-2 square by starting with any box in the first 4 rows and first 4 columns. There are a total of 4 4 = 16 of them.

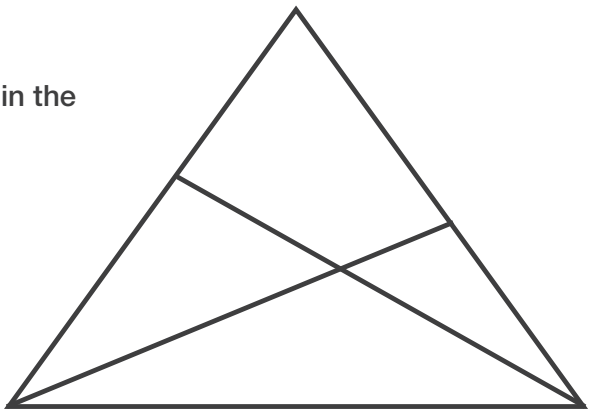
Each 3-by-3 box is also a square. Starting in the top left, you can get a 3-by-3 square by starting with any box in the first 3 rows and first 3 columns. There are a total of 3 3 = 9 of them.

Each 4-by-4 box is also a square. Starting in the top left, you can get a 4-by-4 square by starting with any box in the first 2 rows and first 2 columns. There are a total of 2 2 = 4 of them.

There is only one 5-by-5 square, it's the entire grid.

The total number of squares is: 52 + 42 + 32 + 22 + 1 = 25 + 16 + 9 + 4 + 1 = 55.

How many triangles are in the shape on the right?



Solution:

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A Mobius strip is made by taking a long strip of paper and connecting the ends with a half-twist; turning it into a surface with only one boundary.

If you gave a strip of paper 2 half-twists, would it result in a surface with only one boundary or two ? How about if you gave it 3 half-twists?

Solution:

Giving the strip of paper 2 half-twists and then connecting the ends will give a solid with 2 boundaries.

This means that you need two separate lines to be able to draw on "both sides" of the paper.

Giving the strip of paper 3 half-twists and then connecting the ends will give a solid with 1 boundary.

This means that you can draw one continuous line (without lifting your pencil) and it will cover "both sides" of the paper before reaching your original starting point.