

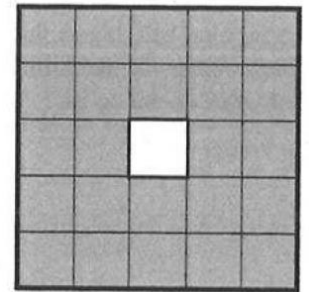
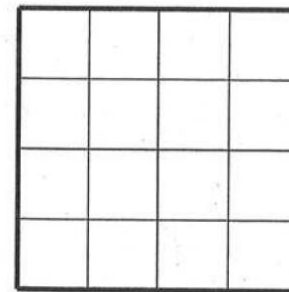
Problem 1: "An Even Split"

Anja would like to split a....

a) 4 x 4 square

b) 5 x 5 square with the middle piece removed

(See picture to the right)



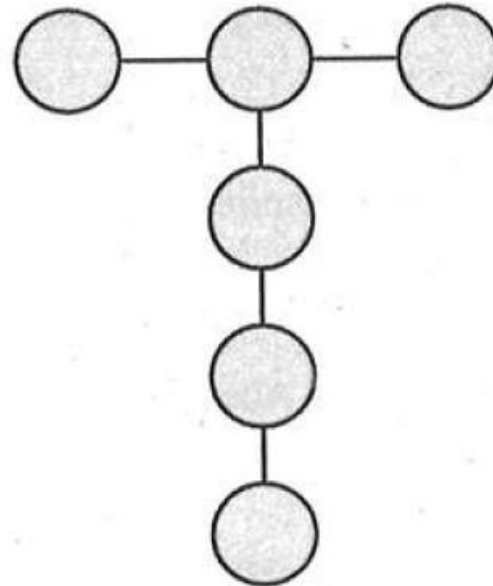
along the lines in four pieces of equal size and form.

Find as many possible ways to do so for each figure.

Problem 2: "The Magic T"

Anja wishes to insert six consecutive numbers in the circles below so that the sum of the numbers along any line are equal.

Do this in as many ways as you can.



Problem 3: "3-ful Numbers"

Mia calls a non zero number "3-ful" when it contains only the digits "3" and "0". Ex: 33, 300, 330, 33303

Mia writes all 3-ful numbers less than 10000. How many are there?

Problem 4: "Similar Numbers"

Lutz calls two numbers "similar" when they contain the same number of each of their digits. Ex: 1020 and 2010 are similar as they contain two 0's, one 1, and one 2.

How many numbers are similar to 2019?

Problem 5: "Keeping Distance"

The numbers 1,1,2,2,3,3,4,4,5,5,6,6,7,7, are placed in the table below so that the distance between each pair of like numbers is as big as the number itself. Ex: The distance between two "4"s is 4.

Three of these numbers are placed in the table below:

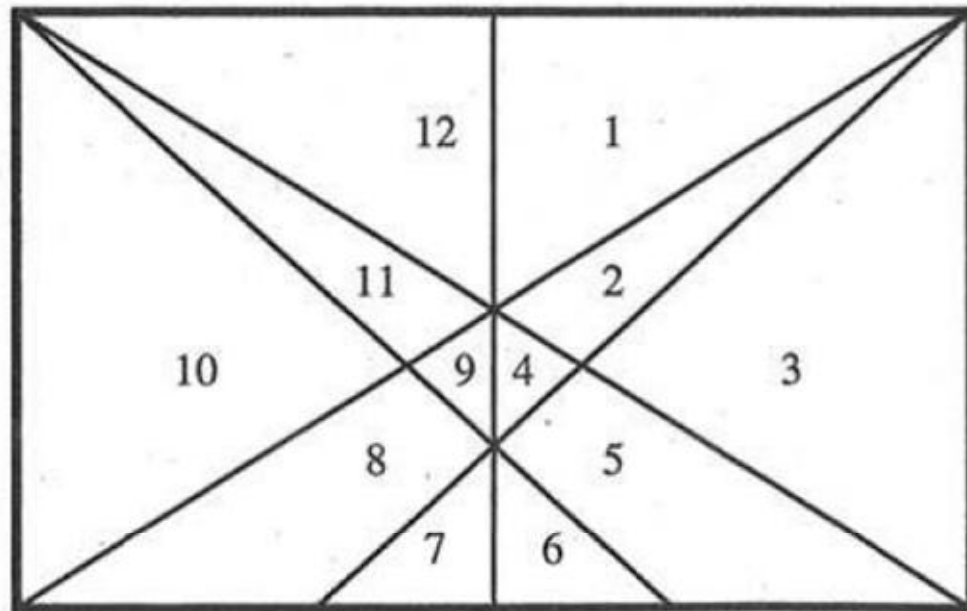
				6			2		5				
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Insert the remaining numbers in the table.

Problem 6: "Puzzling"

Anna cut a photo into pieces, which she reassembled as a puzzle and numbered as shown in the diagram.

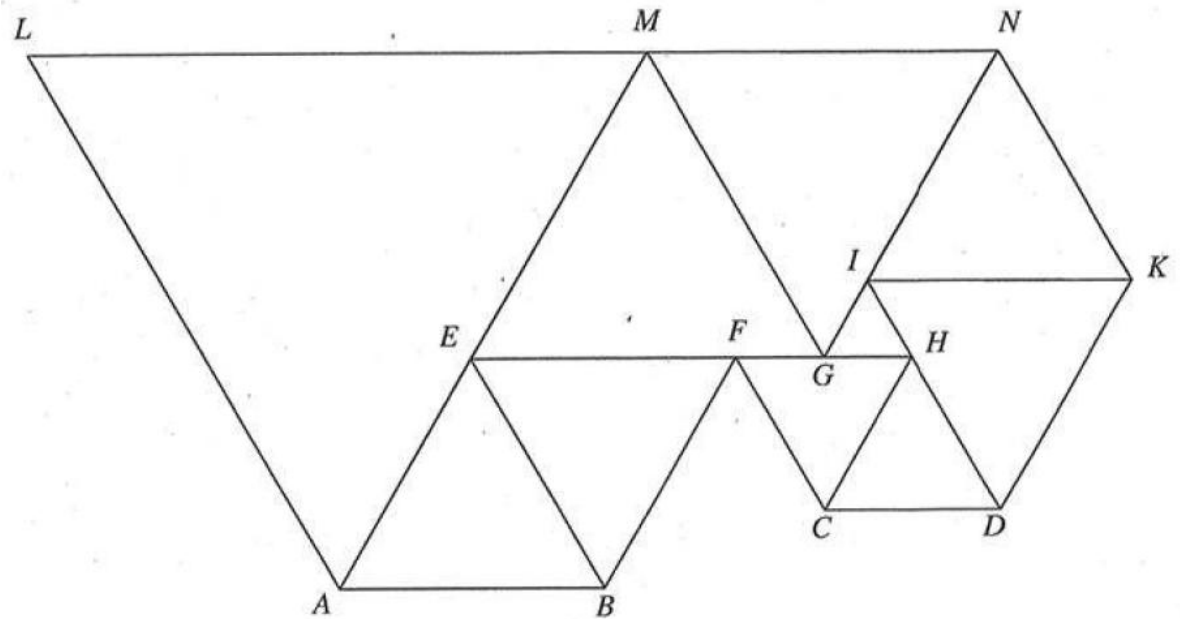
How many triangles do you recognize in the picture?



Problem 7: "Equilateral Triangles"

The picture below contains only equilateral triangles. In particular,
[GH]=2cm and [IK] = 6cm

Calculate [AL] and hence, find the number of times that the smallest triangle fits in the largest.



Problem 8: "The Honest Knight?"

A group of knights eat together at a round table. Some of them always tell the truth, whilst others always lie. Each knight claims that his neighbor to the right lies and that his neighbor to the left is a liar. Alfons reports later that eleven knights were present. Bert says, however, that Alfons is lying and that there were actually twelve knights present.

Using this information, find the number of knights at the table.

Problem 9: "Mouse Hunt"

Alf, Tim, Jerry and Fopsy go on a mouse hunt.

Together, Tim and Fopsy catch as many mice as Alf and Jerry together.

Alf catches more mice than Jerry.

Together, Alf and Fopsy catch less mice than Tim and Jerry together.

How many mice did each cat catch, if Tim caught three?

Problem 10: "Time's Running"

Anna plays a game in which she tells time as they did in the Middle Ages. She tries to tell time using two hourglasses, one with a time of 7 minutes and one with a time of 5 minutes.

By cleverly turning the hourglasses, how can she measure a time of 16 minutes? 13 minutes?