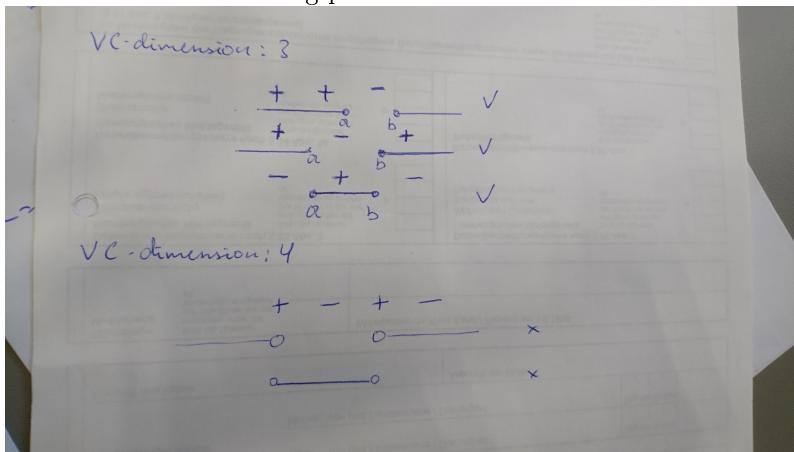


Exercise 1

a)

The VC-dimension is 3, because you can shatter all sets of size 3, but it is not possible to shatter the set $\{+ - + -\}$. Like to see in the following picture:



b)

The VC-dimension is ∞ ,

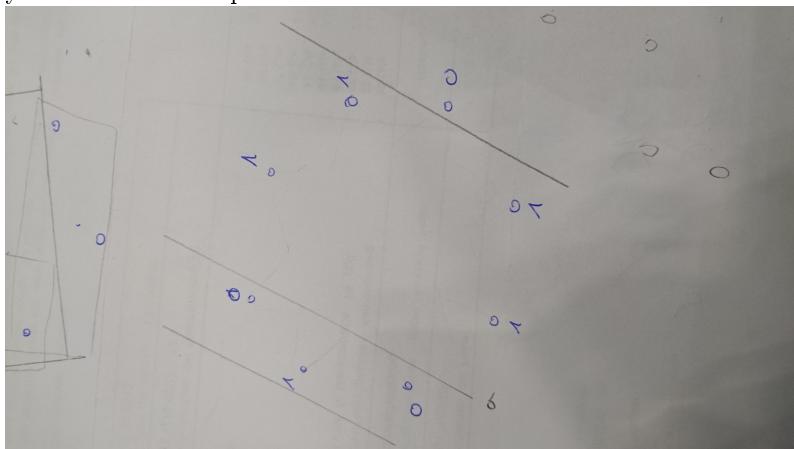
You construct the set as following:

1. All numbers are constructed as product of prime numbers
- 2.

Exercise 2

The first observation is, the points have to be in a circle. Wouldn't they be in a circle, there would always be a point in the middle, that destroys the shattablilty. The points outside and the point in the middle would have to be of the same "classification".

It is possible to sort 7 points such that they are shattable. Subsets of size 1 and 2 are trivial. All other combinations you can see on the picture.



If you try for 8 points this construction you will fail with a subset of 3. We know because of the beginning, that they have to be in a ring organized. If you have that than the following is a counterexample of a subset.

