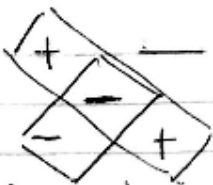
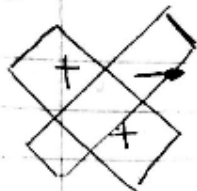


Question 5

a) Union of two rectangles

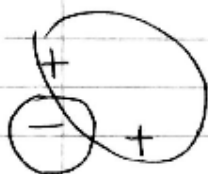
VC Dimension 3:



Does not shatter

b) Union of two Circles

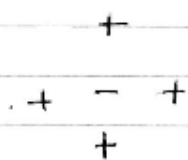
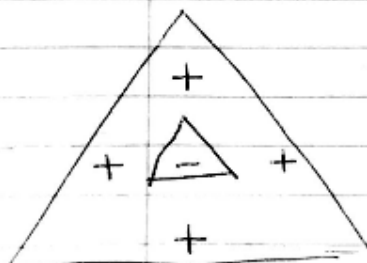
VC Dimension 3



Does not shatter.

c) Union of two Triangles

VC Dimension 5



Does not shatter.

given that 2

d) multi-dimensional "sphere" with m dimensions.

VC Dimension: $m+1$.

Consider $m+2$ points, and there exists a set S where $m+2$ points can be shattered. Then for any partition A_1, A_2 , there are spheres such that they intersect, but there is no point of S in their intersection, that means the individual sphere can be shattered which is a contradiction.

Also, we can see that $m+1$ points consisting of unit vectors and origin can be shattered by the sphere.