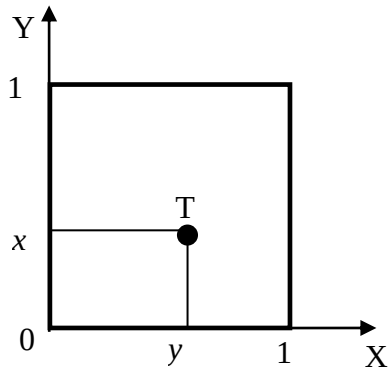
Year 5. Session 113 (2009-2010 school year).
Set Theory.

Def: A set ***has cardinality of continuum*** if it is equivalent to a set of points on a line.

Question: Do the set of points inside a square have bigger cardinality then a set of points on a side of this square?

Cantor's proof:



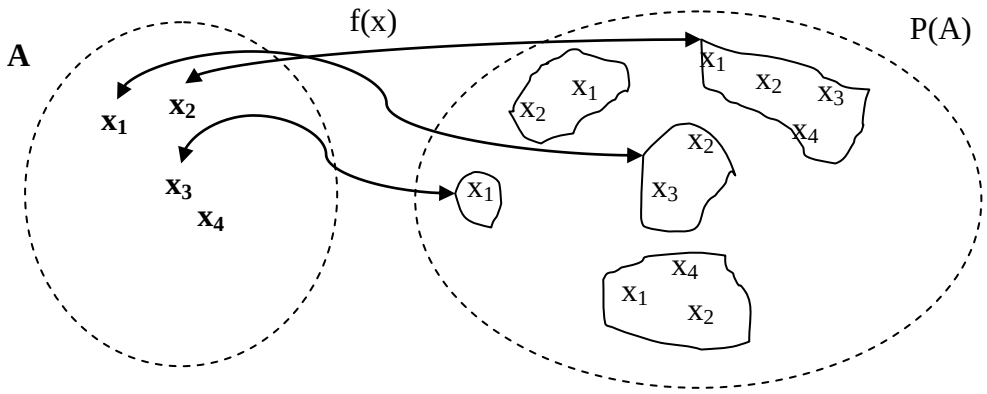
$T = (x, y)$
$x = 0.x_1x_2x_3x_4$ ....
$y = 0.y_1y_2y_3y_4$ ....

$z = 0.x_1y_1x_2y_2x_3y_3$ ... ..

Question: Does there exist an "intermediate" set of point – bigger then a countable set, but smaller then a continuum?

Question: Does there exist a set of points with cardinality bigger then continuum?

Cantor's theorem:
For any set A, the set of all subsets of A has greater cardinality then the set A itself.
Proof:
A – set of elements x
P(A) – set of all subsets of A



$B = \{x \in A : x \notin f(x)\}$