If $(0,1)$ is countable, then $\exists$ a 1-1 function (& onto)
$f: \mathbb{N} \to (0,1)$.

$f(n)$ = some decimal (it's a real # in $(0,1)$)
$f(1)$
$f(2)$
. . .
$f(n)$ . .

	1	2	3	4	5	6
1	$1/1$	$2/1$	$3/1$			
2	$1/2$					
3	$1/3$					
4	$1/4$					
5	$1/5$					
6						

$$A \times B = \{(a,b) \mid a \in A \text{ and } b \in B\}$$

$$\mathbb{R}^2 = \mathbb{R} \times \mathbb{R} = \{(x,y) \mid x, y \in \mathbb{R}\}$$

3A. Union of 2 finite sets is finite

Let A & B be finite sets with cardinality m & n respectively.

$\Rightarrow$ there is a 1-1 correspondence f between A & ~~a set of~~ the set $\{1, 2, \dots, m\}$. & a 1-1 correspondence g between B + the set $\{1, 2, \dots, n\}$

The set $A \cup B$

Let the elements of A be $\{a_1, a_2, \dots, a_m\}$ & elements of B be $\{b_1, b_2, \dots b_n\}$

Define $h : \mathbb{N} \to A \cup B$ so that

$h(1) = a_1$, $h(2) = a_2$, $\dots h(m) = a_m$

$h(m+1) = b_1$, $h(m+2) = b_2$, $\dots h(m+n) = b_n$.

h as defined is finite. If $h(x) = h(y)$ for any x, y, we are making the set smaller but still finite

1.3

#1, 3, 7, 9

Read 1.4