Cardinality of sets

Card = num of elements in the set

Infinite Cardinality:

|A| , |B|

f: A → B and g: B → A → Schroder-Bernstein theorem

f: A → B tells us that |A| ≤ |B| and

g: B → A is |B| ≤ |A| so it should be |A| = |B|

1) Show that all ints are countable:

$f(n) = \frac{n}{2}$ $\quad f(n) = \frac{-(n-1)}{2}$

1 2 3 4 5 6 7

0, 1, -1, 2, -2, 3, -3

2) Prove that rational num is countable

$\aleph_0$ Aleph Null

{1, 2, 3, 4, 5, 6, 7 ...

1 ↔	N	Y	Y	N
2 ↔	N	N	N	N
3 ↔	Y	Y	Y	Y
4 ↔	N	Y	N	Y

The subset of even number and odd or subset of present numbers

3) Since room is countable and name is uncountable, we cannot fit people in Hilbert's hotel