1. Algebra : a set of sets ,
2. Events ; set of outcomes 🡪 elements of algebra
3. Closed ; the results of finite set operation is in algebra
4. Countable

{1,2,3},{1,2,3,4,….,1000},{1,2,3,…,n},

# of {1/3,2/3.3/3}🡪 3

S = {1/n,2/n,…,n/n} .--> S is of rational numbers, and # of S is n and countable even if n goes to infinite.

Irrational number is in any interval of rational numbers!!

The set of irrational numbers in any interval is uncountable.--> this leads to the problems to define the probability

1. Redundancy

5.1) 2:1 redundancy

System fail = Branch\_1 failed and Branch\_2 failed

Branch\_1 failed = one of Branch\_1 gyro failed

Branch\_gyro failed = P(gyro\_fail)= p

Branch\_1 failed = one of Branch\_1 gyro failed= {X\_gyro failed or Y\_gyro failed or Z\_gyro failed}

**P(Branch\_1 failed)** = 1 – P{Branch\_1 succeed} = 1- (1-P(X\_gyro failed))(1-P(Y\_gyro failed))(1-P(X\_gyro failed)) =

**System failed** = Branch\_1 failed and Branch\_2 failed =

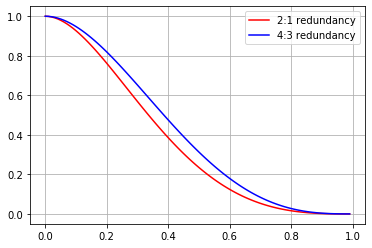
**P(System succeed)** =

5.2) 4:3 redundancy

**System succeed** = (all gyro succeed) or (3 succeed among 4 gyros)

P(**System succeed) =P(**(all gyro succeed) or (3 succeed among 4 gyros))

=



1. distributive law

6.1)

* 1. If 🡪 🡪
  2. Or if 🡪 .QED

6.2)

,

1.1) Assume -> then

1.2) Assume If , then x should be in C (if 🡪

If then , which is contradict to

* 1. by 1.1) and 1.2), 🡪 QED.

By 6.1) and 6.2)