# The Master Method

the bottom level (the leaf node level)

the number of leaf nodes

If

Then

## Proof

At each level , there is separate recursions, each of size .

Therefore the total work done at that level is .

# Probability

* **Sample Space** **(Ω)** : “all possible outcomes”
  + - every element in Ω has a probability greater than 0
    - the sum of the probability of the elements in Ω is 1
* **Event (S)**: a subset of the Sample Space ()
  + probability of an event
* **Cardinality:** array length (number of elements in a subset)
* **Random Variable (X)**: X is a real valued function (e.g. sum of two dice)
* **Expectation/Expected Value (E[X])**: the average value of X
* Linearity of Expectation:
* Geometric Random Variable – googlethis

# Graphs

* = number of vertices (aka nodes); = number of edges
* In a connected graph,
* Generally, is and

# Misc

* Binomial Coefficient
  + “ choose ”, the number of ways to choose elements from a set of elements
  + measures combination (vs. permutation): sequence does not matter
    - if , then