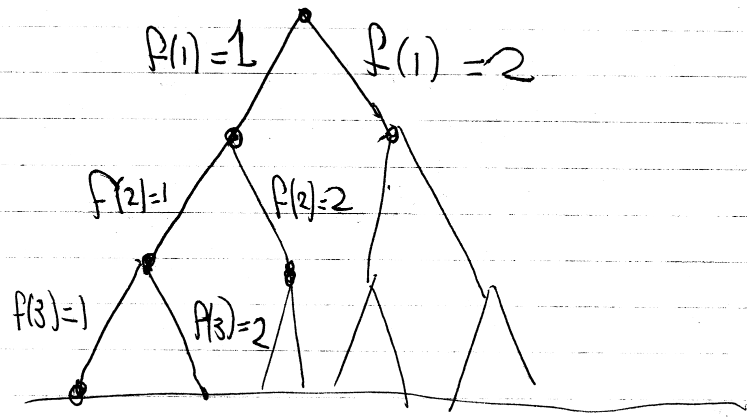
8/08/2006

$[m] = \{1, 2, 3, \dots, m\}$

How $f : [n] \longrightarrow [m]$

$\phi(m,n) = \#$ of f.

$n = 3$, $m = 2$ $\qquad \phi(2,3) = 2^3$



$f(1)=1$
$f(2)=1$
$f(3)=1$

$2 \times 2 \times 2$

$\boxed{\text{NOT } 2+2+2}$

Having fixed $f(n+1)$

we have to choose rest of

f in $\phi(m,n)$ ways.

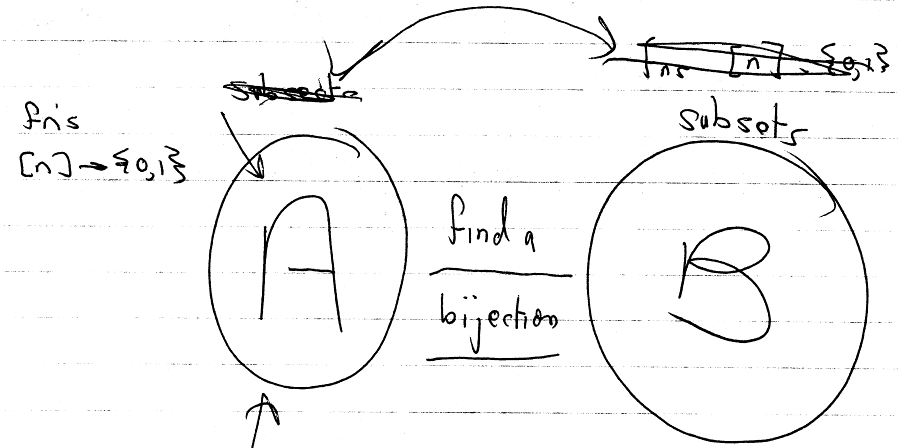
$$\text{Total} = \#\text{ choices for } f(n+1) \times \phi(m,n) = m^{n+1}.$$

Sequences

$$\begin{array}{cccc} x_1 & x_2 & \cdots & x_n \\ \updownarrow & \updownarrow & \cdots & \updownarrow \\ f(1) & f(2) & & f(n) \end{array}$$

There are 2^n subsets of $\{1, 2, \ldots, n\}$

$= \#\text{maps } [n] \to \{0,1\}$



I know $|A|$ $\qquad |B| = ?$

If $\exists$ bijection $A \to B$

then $|A| = |B|$.

$n = 7$ Odd n

odd $S \subseteq [7]$

$\overline{S}$

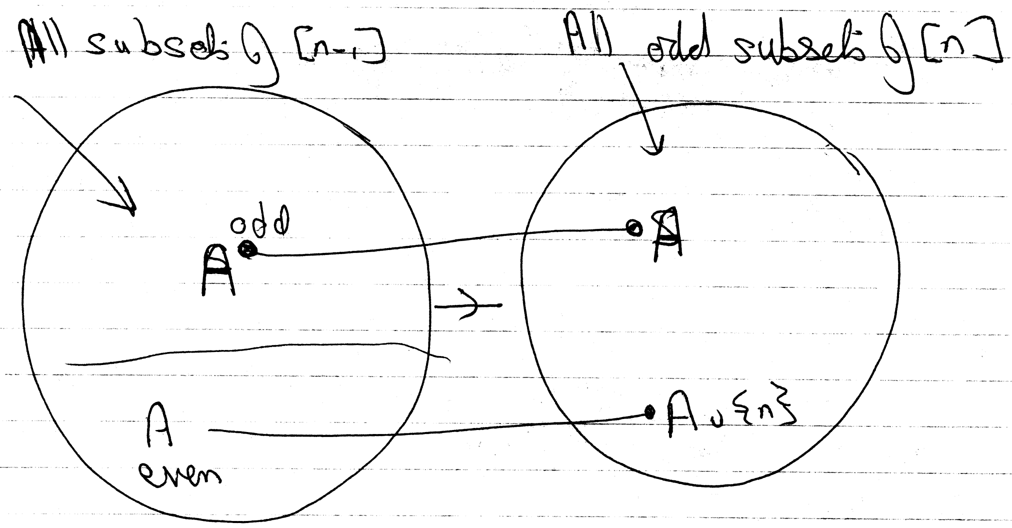
even

$n = 8$?

S even

$\overline{S}$ even

?



Size $= 2^{n-1}$

Onto & $\underline{1-1}$

<u>Onto?</u> $A' \subseteq [n]$, A' odd

$n \notin A'$ A' come from itself

$n \in A$ A' come from $\underbrace{A' - n}_{\text{even}}$

($\underline{1\text{-}1}$) Given A', I can work out unique A mapped to it.