MATH 532 Discussion WEDNESDAY 09/09

The 12-Fold Way

$\#N = n$ "balls"
$\#X = x$ "boxes"

$f : N \longrightarrow X$

N	X	Any f	Injective f	Surjective f
DIST ① ② ⋯	DIST 1 2 ⋯	x^n	$x(x-1)\cdots(x-n+1) = (x)_n$	$x!\,S(n,x)$
INDIST ○○○ ⋯	DIST 1 2 ⋯	$\left(\!\binom{x}{n}\!\right)$	$\binom{x}{n}$	$\left(\!\binom{x}{n-x}\!\right)$
DIST ① ② ⋯	INDIST □ □ ⋯	$\sum_{k=0}^{x} S(n,k)$	$\begin{matrix}1 & n \le x \\ 0 & n > x\end{matrix}$	$S(n,x)$
INDIST ○○○ ⋯	INDIST □ □ ⋯	$\sum_{k=0}^{n} p_k(n)$	$\begin{matrix}1 & n \le x \\ 0 & n > x\end{matrix}$	$p_x(n)$