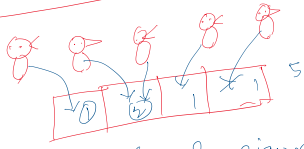
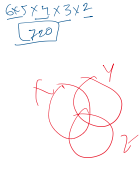


Pigeonhole - Union
 $|0-5| \leq 1$
 $x=23$
 $y=42$
 $2+3=5$
 $x+y=5$
 $2! \cdot 3! = 5!$

012345
 2501234
 4120345
 019235
 $5! + 5!$
 $(x) + (y) - 4!$
 $= 100 + 100 - 24$
 $= 176$



Suppose a flock of pigeons fit into a set of pigeonholes - if there are more pigeons than the pigeonholes, then there must be at least 1 pigeonhole that has more than 1 pigeon

if $(k+1)$ pigeons/objects are placed into k boxes, then there is at least 1 box containing $2 \geq$ objects

Ex 1: $\frac{366}{n+1}$ Birthday problem

Word problem
 Ex 2: 26
 Minimum # of words that start w/ same letters.
 $26+1$

General expression:

if n objects are placed into k boxes, then there is 1 box containing $\lceil \frac{n}{k} \rceil$ objects

$\lceil * \rceil$

$\lceil \frac{5}{4} \rceil = 2$

$\lceil 3.14 \rceil = 4$
 $\lfloor 3.14 \rfloor = 3$

socks
problem

Basket: 5 pairs of Blue socks
5 pairs of Red socks

I. How many socks must be
selected to ensure 3 socks of

same color?

7

R B R B R B R B R

RR BB (P/B)

II: to ensure 3 Blue socks?