Section 2.6 counting

$\boxed{50}$

Всех событий 365^n

уникальных $\dfrac{365!}{(365-n)!}$ permutations we care about ordering

1	2
1	3
1	4
2	1
2	3
2	4
3	
4	

$\dfrac{n!}{k!(n-k)!}$ combinations

Мне нужно использовать premutations (

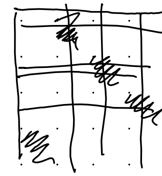
$n = 23$ $\quad P = \frac{1}{2}$

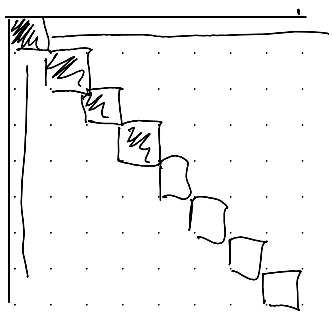
50% это уникальные дни рождения.

$\boxed{2}$

8 rooks (ладья)

Safe from each other





2 расстановки удовлетворяют условию

Не важно combinations becaus rooks are indistinguishable between each other

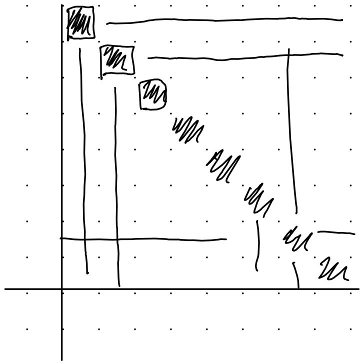
$$P = \frac{16}{\binom{64}{8}} = \frac{16 \cdot 8! \cdot 56!}{64!} =$$

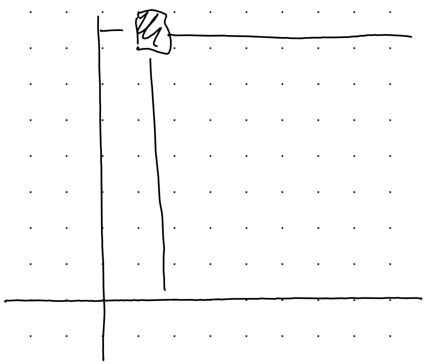
$$= \frac{\cdot \cancel{8} \cdot \cancel{7} \cdot \cancel{6} \cdot \cancel{5} \cdot \cancel{4} \cdot 3 \cdot \cancel{2}}{\cancel{64} \cdot \cancel{63} \cdot \cancel{62} \cdot 61 \cdot \cancel{60} \cdot 59 \cdot 58 \cdot \cancel{57}} =$$

$\cancel{8}$ 9 31 $\cancel{10}$ 19

$\cancel{2}$ 2

$$= \frac{1}{67.109}$$





64
49
15

64 · 49 · 36 · 25 · 16 · 9 · 4 ·

$\boxed{3}$

n - balls in urn

m - are red

k - select balls without replacement

What's the probability that i balls are red

not independent

independent

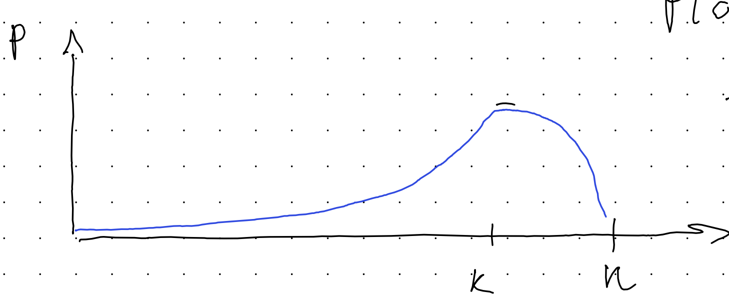
$$p(k) = \binom{n}{k} p^k (1-p)^{n-k}$$

binomial coefficient

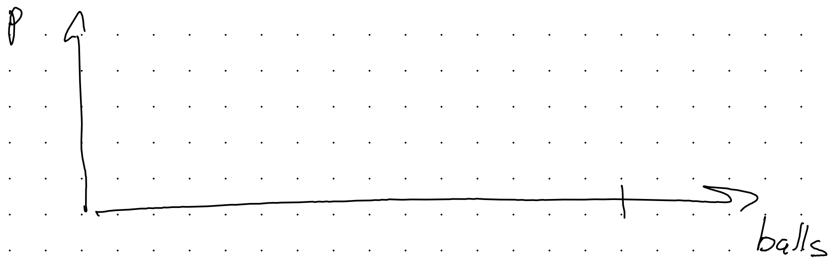
binomial probability

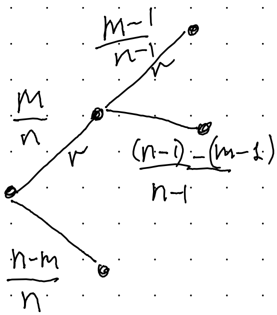
$$\sum_{k=0}^{n} \binom{n}{k} p^k (1-p)^{n-k} = 1$$

$$P(\text{data} \mid \text{success rate}) = \binom{n}{k} (sr)^k (1-sr)^{n-k}$$



$$P_1\left(i=1 \mid SR = \frac{m}{n}\right) = \frac{m}{n}$$





r b r

r r r

\# $n = 5$

$m = 2$

$$\frac{m}{n}\ \frac{m-1}{n-1}\ \frac{m-2}{n-2}$$

r r r

r r b

$$\frac{m}{n}\cdot\frac{m-1}{n-1}\cdot\frac{(n-2)-(m-2)}{n-2}$$

r b r $\rightarrow$ $\frac{m}{n}\cdot\frac{(n-1)-(m-1)}{n-1}\cdot\frac{m-2}{n-2}$

b r r

$$\frac{n-m}{n}\cdot\frac{m}{n-1}\cdot\frac{m-1}{n-2}$$

$$\frac{m}{n}\cdot\frac{n-m}{n-1}\cdot\frac{m-1}{n-2}$$

$$p\left(i \text{ red balls}\right) = $$

q: is individual selecting i balls of same colore out of k selections without repetition has the same probability

$$\frac{m}{n} \cdot \frac{m-1}{n-1} \cdot \ldots \cdot \frac{m-i+1}{n-i+1} \cdot \frac{(n-i)-(m-i)}{n-i} \cdot \ldots$$

$$\cdot \frac{(n-k+1)-(m-k+1)}{n-k+1}$$