$\mathbb{Z}_2 = \{0, 1\}$

$$\boxed{\begin{aligned} \underline{0} + \underline{1} &= \underline{1} \\ \underline{1} + \underline{1} &= \underline{0} \\ \underline{0} + \underline{0} &= \underline{0} \end{aligned}}$$

$\mathbb{Z}_3 = \{0, 1, 2\}$

·	0	1	2
0	0	0	0
1	0	1	2
2	0	2	1

+	0	1	2
0	0	1	2
1	1	2	0
2	2	0	1

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$\mathbb{Z}_4$

·	0	1	2	3
0	0	0	0	0
1	0	1	2	3
2	0	2	0	2
3	0	3	2	1

$a \cdot b = 0 \quad a \neq 0, \; b \neq 0$

$\underbrace{a^{-1} \cdot a}_{1} \cdot b = b \Rightarrow b = 0$

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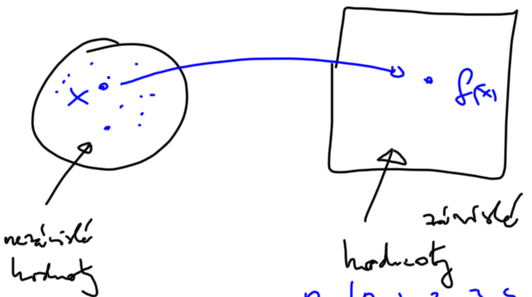
funkce:



$f(n) = n!$

n	0	1	2	3	4	5
$f(n)$	1	1	2	6	24	120

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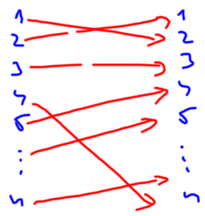
$n \cdot (n-1) \cdot (n-2) \cdot \ldots \cdot 2 \cdot 1 = n!$



$(a+b)^2 = (a+b)(a+b)$
$= a^2 + 2ab + b^2$

$$\overbrace{(a+b) \cdot (a+b) \cdot \ldots \cdot (a+b)}^{n\times} = \sum_{k=0}^{n} \binom{n}{k} a^k b^{n-k}$$

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Důkaz (2): naopak:

$$\binom{n}{k} + \binom{n}{k+1} = \frac{n!}{k!\,(n-k)!} + \frac{n!}{(k+1)!\,(n-k-1)!}$$

$$= \frac{(k+1)n! + (n-k)n!}{(k+1)!\,(n-k)!} = \frac{(n+1)!}{(k+1)!\,(n-k)!} = \binom{n+1}{k+1}$$

$$\binom{0}{0} = \frac{0!}{0!\,0!} = 1$$

$$\boxed{\binom{n}{k} := 0 \quad \begin{aligned} k &< 0 \\ k &> n \end{aligned}}$$

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$$\sum_{k=0}^{n} \binom{n}{k} = 2^n \quad ✓$$

$$\sum_{k=0}^{n+1} \binom{n+1}{k} = \sum_{k=0}^{n+1} \left(\binom{n}{k-1} + \binom{n}{k} \right)$$

$$= \sum_{k=-1}^{n} \binom{n}{k} + \sum_{k=0}^{n} \binom{n}{k} =$$

$$= 2 \cdot 2^n = 2^{n+1} \quad ✓$$

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$F(n, f(n)) = (n+1) \cdot f(n)$

vede na $f(n) = n!$

$f(n+1) = \left(1+\frac{6}{12}\right) \cdot f(n) + b$

měsíční úrok

splátka

$f(n) = a \cdot f(n-1) + b$

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