Odhady:

$$
\begin{aligned}
H_n &= \ln n + \gamma + \frac{1}{2n} + \frac{1}{12n^2} + \frac{1}{120n^4} + O(n^{-6}) \\
n! &= \sqrt{2\pi n}\left(\frac{n}{e}\right)^n \left(1 + \frac{1}{12n} + \frac{1}{288n^2} - \frac{139}{51840n^3} + O\left(n^{-4}\right)\right) \\
\Pi(n) &= \frac{n}{\ln n} + \frac{n}{\ln^2 n} + \frac{2!}{\ln^3 n} + \frac{3!}{\ln^4 n} + O(\frac{n}{\log^5 n}) \\
e^z &= 1 + z + \frac{z^2}{2!} + \frac{z^3}{3!} + \frac{z^4}{4!} + O(z^5) \\
\ln(1+z) &= z - \frac{z^2}{2} + \frac{z^3}{3} - \frac{z^4}{4} + O(z^5) \\
\frac{1}{1-z} &= 1 + z + z^2 + z^3 + z^4 + O(z^5) \\
(1+z)^\alpha &= 1 + \alpha z + \binom{\alpha}{2} z^2 + \binom{\alpha}{3} z^3 + \binom{\alpha}{4} z^4 + O(z^5)
\end{aligned}
$$

Manipulacia s generujucimi funkciami:

$$
\begin{aligned}
\alpha F(z) + \beta G(z) &= \sum_n (\alpha f_n + \beta g_n) z^n \\
z^m G(z) &= \sum_n g_{n-m} z^n, \qquad \text{integer } m \geq 0 \\
\frac{G(z) - g_0 - g_1 z - \ldots - g_{m-1} z^{m-1}}{z^m} &= \sum_{n \geq 0} g_{n+m} z^n, \qquad \text{integer } m \geq 0 \\
G(cz) &= \sum_n c^n g_n z^n \\
G'(z) &= \sum_n (n+1) g_{n+1} z^n \\
zG'(z) &= \sum_n n g_n z^n \\
\int_0^z G(t)dt &= \sum_{n \geq 1} \frac{1}{n} g_{n-1} z^n \\
F(z)G(z) &= \sum_n \left(\sum_k f_k g_{n-k}\right) z^n \\
\frac{1}{1-z} G(z) &= \sum_n \left(\sum_{k \leq n} g_k\right) z^n
\end{aligned}
$$

Fibonacci:

$$
\begin{aligned}
F_{2n+2} &= F_1 + F_3 + \ldots + F_{2n+1} \\
F_{2n+1} &= F_0 + F_2 + F_4 + \ldots + F_{2n} \\
F_n^2 - F_{n+1}F_{n-1} &= (-1)^{n+1} \\
F_n F_{n+1} &= F_1^2 + F_2^2 + \ldots F_n^2 \\
F_{2n}^2 &= F_1F_2 + F_2F_3 + \ldots F_{2n-1}F_{2n} \\
F_{n+2} &= F_0 + F_1 + F_2 + \ldots + F_n \\
F_{n+m} &= F_{m-1}F_n + F_m F_{n+1} \\
F_{n+1}F_{n+2} - F_n F_{n+3} &= (-1)^n \\
F_{2n-1} &= F_n^2 + F_{n-1}^2 \\
F_{3n} &= F_{n+1}^3 + F_n^3 - F_{n-1}^3 \\
F_n^4 - F_{n-2}F_{n-1}F_{n+1}F_{n+2} &= 1
\end{aligned}
$$

Jednoduche postupnosti a ich generujuce funkcie:

sequence	generating funcion	closed form
$\langle 1,0,0,0,0,0,\ldots\rangle$	$\sum_{n\geq 0}[n=0]z^n$	1
$\langle 0,\ldots,0,1,0,0,\ldots\rangle$	$\sum_{n\geq 0}[n=m]z^n$	z^m
$\langle 1,1,1,1,1,1,\ldots\rangle$	$\sum_{n\geq 0} z^n$	$\frac{1}{1-z}$
$\langle 1,-1,1,-1,1,-1,\ldots\rangle$	$\sum_{n\geq 0}(-1)^n z^n$	$\frac{1}{1+z}$
$\langle 1,0,1,0,1,0,\ldots\rangle$	$\sum_{n\geq 0}[2\backslash n]z^n$	$\frac{1}{1-z^2}$
$\langle 1,0,\ldots,0,1,0,\ldots,0,1,0,\ldots\rangle$	$\sum_{n\geq 0}[m\backslash n]z^n$	$\frac{1}{1-z^m}$
$\langle 1,2,3,4,5,6,\ldots\rangle$	$\sum_{n\geq 0}(n+1)z^n$	$\frac{1}{(1-z)^2}$
$\langle 1,2,4,8,16,32,\ldots\rangle$	$\sum_{n\geq 0} 2^n z^n$	$\frac{1}{1-2z}$
$\langle 1,4,6,4,1,0,0,\ldots\rangle$	$\sum_{n\geq 0}\binom{4}{n}z^n$	$(1+z)^4$
$\langle 1,c,\binom{c}{2},\binom{c}{3},\ldots\rangle$	$\sum_{n\geq 0}\binom{c}{n}z^n$	$(1+z)^c$
$\langle 1,c,\binom{c+1}{2},\binom{c+2}{3},\ldots\rangle$	$\sum_{n\geq 0}\binom{c+n-1}{n}z^n$	$\frac{1}{(1-z)^c}$
$\langle 1,c,c^2,c^3,\ldots\rangle$	$\sum_{n\geq 0} c^n z^n$	$\frac{1}{1-cz}$
$\langle 1,\binom{m+1}{m},\binom{m+2}{m},\binom{m+3}{m},\ldots\rangle$	$\sum_{n\geq 0}\binom{m+n}{m}z^n$	$\frac{1}{(1-z)^{m+1}}$
$\langle 0,1,\frac{1}{2},\frac{1}{3},\frac{1}{4},\ldots\rangle$	$\sum_{n\geq 1}\frac{1}{n}z^n$	$\ln\left(\frac{1}{1-z}\right)$
$\langle 0,1,-\frac{1}{2},\frac{1}{3},-\frac{1}{4},\ldots\rangle$	$\sum_{n\geq 1}\frac{(-1)^{n+1}}{n}z^n$	$\ln(1+z)$
$\langle 1,1,\frac{1}{2},\frac{1}{6},\frac{1}{24},\frac{1}{120},\ldots\rangle$	$\sum_{n\geq 0}\frac{1}{n!}z^n$	e^z

Ine vzorceky:

$$\begin{aligned}
\sum_{k=0}^{n} a^k &= \frac{a^{n+1}-1}{a-1}\\
\sum_{k=0}^{n} \frac{1}{a^k} &= \frac{a}{a-1}-\frac{1}{(a-1)a^n}\\
\sum_{k=0}^{n} k\cdot a^k &= \frac{na^{n+2}-(n+1)a^{n+1}+a}{(a-1)^2}\\
k\cdot k! &= (k+1)!-k!\\
H_k^{(m)} &= \sum_{k=1}^{n}\frac{1}{k^m}\\
\sum_{k=1}^{n-1} H_k &= nH_n-n\\
\sum_{k=0}^{n} k &= \frac{n(n+1)}{2}\\
\sum_{k=0}^{n} k^2 &= \frac{n(n+1)(2n+1)}{6}\\
\sum_{k=0}^{n} k^3 &= \binom{n}{2}^2\\
(n+1)H_{n+1} &= nH_n+1\\
\binom{n}{k} &= \binom{n}{n-k}\\
\binom{r}{k} &= \frac{r}{k}\binom{r-1}{k-1}\\
(r-k)\binom{r}{k} &= r\binom{r-1}{k}
\end{aligned}$$