$F_0=0,\ F_1=1,\ \boxed{F_{n+2}=F_{n+1}+F_n}$

$(F_i) = (0,1,1,2,3,5,8,13,21,\dots)$

$[n=5]F_n = F_5 = 5$ $\boxed{\begin{array}{l} n=0:\ F_0 = 0\ ✓ \\ n=1:\ F_1 = F_0 + 0\ ? \end{array}}$

$\boxed{F(x)}$ $[x^n]F(x) = F_n$

$$\boxed{F(x) = xF(x) + x^2F(x) + x}$$

$$\sum_{n=0}^{\infty} F_n x^n = \sum_{n=0}^{\infty} F_n x^{n+1} + \sum_{n=0}^{\infty} F_n x^{n+2} + x$$

$x^{n+2}$: $F_{n+2} = F_{n+1} + F_n$ pro $n \geq 2$

kvě 7-13:54

$F(x) = xF(x) + x^2F(x) + x$

$\boxed{F(x) = \frac{x}{1-x-x^2}}$ ← rozvinout do mocninné řady

⇒ rozklad na parc. zlomky + binom. věta

$x_{1,2} = \frac{1 \pm \sqrt{5}}{2}$

$F_{n+2} = F_{n+1} + F_n$
$F_n = \lambda^n$ ⇒
$\lambda^2 = \lambda + 1$

$$F(x) = \frac{A}{x-x_1} + \frac{B}{x-x_2} = \frac{a}{1-\lambda_1 x} + \frac{b}{1-\lambda_2 x}$$

$\lambda_1 = 1/x_1$ $\lambda_2 = 1/x_2$

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binomická věta:

$(1+x)^r = \sum_{n\geq 0} \binom{r}{n} x^n$ $\binom{r}{n} = \frac{r\cdot(r-1)\cdot\ldots\cdot(r-n+1)}{n!}$

$\frac{1}{1-x} = \sum_{n\geq 0} x^n$

$\frac{1}{1-\lambda x} = \sum_{n\geq 0} \lambda^n x^n$

$\boxed{\frac{A_1 x + A_2}{x^2+cx+d}}$

$(x-\alpha)(x-\bar{\alpha}) = x^2 - (\alpha+\bar{\alpha})x + |\alpha|^2$

$$\underbrace{a_0 + a_1 x + \dots + a_k x^k}_{=0} = \underset{= a_0}{\bar{a}_0} + \underset{= a_1}{\bar{a}_1}\bar{x} + \dots + \underset{= a_k}{\bar{a}_k}\bar{x}^k$$

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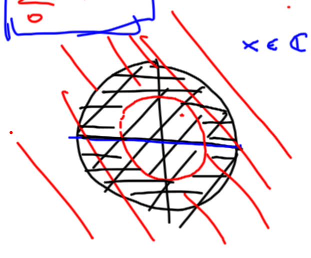
$e^x = \sum_{n=0}^{\infty} 1 \frac{x^n}{n!}$ e.v.f. $\approx (1,1,1,\dots)$

$f(x) = \sum_{-\infty}^{-1} c_n x^n + \boxed{\sum_{0}^{\infty} c_n x^n}$

$x \in \mathbb{C}$



kvě 7-14:50

① $F_n = F_{n-1} + F_{n-2} + [n=0]1$ $F_k = 0$ $k<0$.

② $\sum_{n=0}^{\infty} F_n x^n = \sum_{n=0}^{\infty} F_{n-1} x^n + \sum_{n=0}^{\infty} F_{n-2} x^n + 1$ $\boxed{F_0 = 1}, F_1 = 1$

$F(x) = xF(x) + x^2F(x) + 1$

③ $F(x) = \frac{1}{1-x-x^2}$

④ ⇒ $F_n = [x^n]F(x)$ (binom. věta)

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$x_{1,2} = \frac{5 \pm \sqrt{25-24}}{12} = \begin{cases} 1/2 \\ 1/3 \end{cases}$ ✓

$$\frac{x}{1-\cancel{5x}+6x^2} = \frac{a}{1-3x} + \frac{b}{1-2x} = \frac{a(1-2x)+b(1-3x)}{1-\cancel{5x}+6x^2}$$

$x^0$: $0 = a + b$
$x^1$: $1 = -2a - 3b$ $\Big\}$ ⇒ $1 = a$ $b = -1$

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$$\left(\sum_{n\geq 0} c_n x^n\right)' = \sum_{n\geq 0} n c_n x^{n-1}$$

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