$$a^{-n} = \frac{1}{a^n}$$

$$a^{\frac{m}{n}} = \sqrt[n]{a^m}$$

$$a^{-\frac{m}{n}} = \frac{1}{\sqrt[n]{a^m}}$$

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

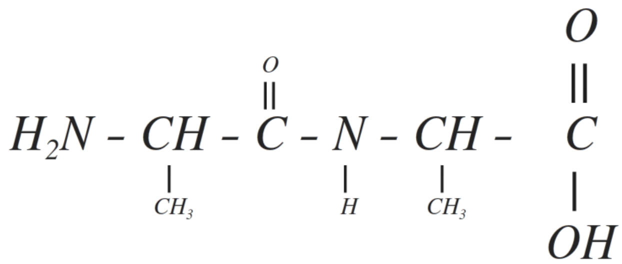
$$S_n = \frac{a_1 + a_n}{2} \cdot n = \frac{2a_1 + (n-1)r}{2} \cdot n$$

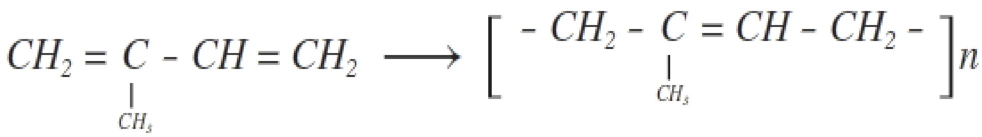
$$S_n = \begin{cases} a_1 \cdot \dfrac{1-q^n}{1-q} & \text{dla} \quad q \neq 1 \\ n \cdot a_1 & \text{dla} \quad q = 1 \end{cases}$$

$$\tau = \langle t \rangle = \frac{\int_0^{\infty} t e^{-\lambda t} dt}{\int_0^{\infty} e^{-\lambda t} dt} = \frac{-1/\lambda^2}{-1/\lambda} = \frac{1}{\lambda}$$

$N(t) = N_0 \cdot \left(\frac{1}{2} \right)^{\frac{t}{T_{1/2}}}$	$C\% = \frac{m_s}{m_{roztw.}} \cdot 100\%$
$p(t) = \frac{N(t)}{N_0} = e^{(-\lambda t)}$	$t = T_{1/2} = \frac{\ln\ 2}{\lambda}$

WZORY CHEMICZNE



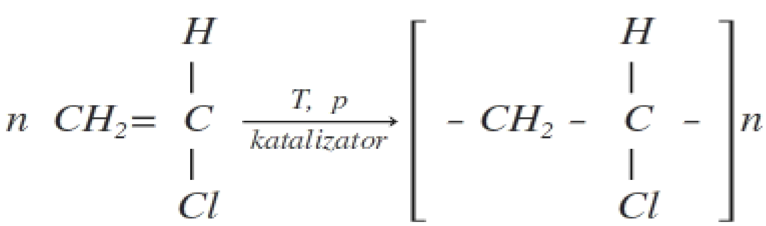


$$2\ Fe + 6\ HNO_3 \xrightarrow[\text{stężenie}]{} Fe_2O_3 + 6\ NO_2 + 3\ H_2O$$

$$2\ Fe^{0-} \longrightarrow 2\ Fe^{III} + 6\ \text{elektronów}$$

$$N + 1\ \text{elektron} \longrightarrow N\ x\ 6$$

$$n\ CH_2{=}CH_2 \xrightarrow[\text{katalizator}]{T,p} [-CH_2-CH_2-]$$



$$H_2SO_4 + 2\ NaOH \xrightarrow[H_2O]{} Na_2SO_4 + 2\ H_2O$$

$$C_{12}H_{22}O_{11} + H_2O \xrightarrow[\text{sacharaza}]{\text{inwertaza}} C_6H_{12}O_6 + C_6H_{12}O_6$$

$$[H^+]=c_0+\frac{K_W}{[H^+]}$$

$$[H^+]^2-c_0[H^+]-K_W=0$$

$$n\ \ CF_2{=}CF_2 \xrightarrow[katalizator]{T,\ p} \left[\begin{array}{ccccc} & F & & F & \\ & | & & | & \\ - & C & - & C & - \\ & | & & | & \\ & F & & F & \end{array}\right]n$$

$$\begin{array}{l} CH\ -\ O\ -\ CO\ -\ C_{17}H_{35} \\ | \\ CH\ -\ O\ -\ CO\ -\ C_{17}H_{35} \\ | \\ CH\ -\ O\ -\ CO\ -\ C_{17}H_{33} \end{array}$$

EKONOMIA WZORY

$$\begin{aligned}\int e^x \cos x\,dx &= \mathrm{Re}\left\{\frac{e^{(1+i)x}}{1+i}\right\} + C\\ &= e^x\,\mathrm{Re}\left\{\frac{e^{ix}}{1+i}\right\} + C\\ &= e^x\,\mathrm{Re}\left\{\frac{e^{ix}(1-i)}{2}\right\} + C\\ &= e^x\,\frac{\cos x + \sin x}{2} + C.\end{aligned}$$

$$PV_{zdolu} = A\cdot\left(m + \frac{m-1}{2}\cdot\frac{r_n}{n}\right)\cdot\frac{1-\left(1+\frac{r_n}{n}\right)^{-n\cdot t}}{\frac{r_n}{n}}$$

$$PV_{zgory} = A\cdot\left(m + \frac{m+1}{2}\cdot\frac{r_n}{n}\right)\cdot\frac{1-\left(1+\frac{r_n}{n}\right)^{-n\cdot t}}{\frac{r_n}{n}}$$

$$FV_{zdolu} = A\cdot\left(m + \frac{m-1}{2}\cdot\frac{r_n}{n}\right)\cdot\frac{\left(1+\frac{r_n}{n}\right)^{n\cdot t}-1}{\frac{r_n}{n}}$$

$$FV_{zgory} = A\cdot\left(m + \frac{m+1}{2}\cdot\frac{r_n}{n}\right)\cdot\frac{\left(1+\frac{r_n}{n}\right)^{n\cdot t}-1}{\frac{r_n}{n}}$$

Wzory: błędy prognoz

$$e = \frac{\sum_{i=1}^{n}(P_i - \mathbf{Pr}_i)}{n}$$

$$d = \frac{\sum_{i=1}^{n}|P_i - \mathbf{Pr}_i|}{n}$$

$$\psi = \frac{\sum_{i=1}^{n}\left|\frac{P_i - \mathbf{Pr}_i}{P_i}\right|}{n}$$

$$s = \sqrt{\frac{\sum_{i=1}^{n}(P_i - \mathbf{Pr}_i)^2}{n-1}}$$

$$P = 1 - \frac{\frac{(N-G)!}{(N-2G)!}\sum_{C=0}^{G}\left(\binom{G}{C}\frac{G!\,(N-2G)!^2}{C!\,(N-2G-C)!}\ \sum_{D=0}^{C}\left(\frac{(N-2G-C)!}{(N-3G-C+D)!}\mathbb{S}(G-D;\ N-G)\sum_{E=0}^{MIN(D;\ G-C)}\left(\binom{C}{D-E}\binom{G-C}{E}\frac{\mathbb{S}(C-D+E;\ C)}{(C-D)!}\right)\right)\right)}{N!\left[\frac{N!}{e}\right]}$$

$$\alpha = \frac{(n-1)\sum_{t=1}^{n-1} y_t u_t - \sum_{t=1}^{n-1} y_t \sum_{t=1}^{n-1} u_t}{(n-1)\sum_{t=1}^{n-1} y_t^2 - \left(\sum_{t=1}^{n-1} y_t\right)^2}$$

$$\beta = \frac{1}{n-1}\sum_{t=1}^{n-1} u_t - \frac{\alpha}{n-1}\sum_{t=1}^{n-1} y_t$$