Algoritm subliego potgovanie IN: $x \in \mathbb{R}$, $n \in \mathbb{N}_0$ OUT: x" $\sqrt{} \leftarrow \times$ $w \in v$ t < 1 while m > 0 if m jest niepernyste 5 4 4 4 L [m ← m // 2] return t $3^{2^{1}} = 3^{(0000)} = 3^{(10$ $3^{1} \rightarrow 3^{2} \rightarrow 3^{8} \rightarrow 3^{16}$ 1 0 1 0 1 b) m pert niepenyste though = t.y Shove 5 mnohe = $\frac{M-1}{2}$ though though = $(2 \cdot 5) \cdot (5) \cdot (5) = 2 \cdot 5 \cdot 5 \cdot 5 = 2 \cdot 5 = 2$

1//2 = 0 1) Cry potte sig honory? mnote = m/2 [-m/2 ENo mnote < m => po surmoner Unite works? 2) NIEZMIENNIK P: 2'y = x n i m > 0 Defédens do potti? TAK: 2.5 = 1.x = x 1 5 Figure Anorro = XV a) m jest perryste 2 none = € Shove = y $m_{\text{hobe}} = \frac{m}{2}$ $t_{\text{NOHE}} = t \cdot \left(\frac{1}{2}\right)^2 =$ $= t \cdot y = x$

nermiens, hech po rehonnent momy: $M \leq O$ i5. h = x , t. Jm = x 7. h = x h $\lim_{x \to 0} x^x = 1$ Meldefini-viere $- \times_{\mu} = \underbrace{\times \cdot \times \cdot \times \cdot \cdot \cdot \cdot \times \cdot \times \cdot \cdot \cdot \times}_{=\times \mu} = \times_{\mu}$ $n = (b_{k}b_{k-1}...b_{1}b_{0})_{2}$ ASP K+1 6,480 -> K+1 06,0480 $2^{k} \le n \le 2^{k} + 2^{n-1} + 2^{n} + 2^{n} = 1 - 1$ $= 1 \cdot \frac{1 - 2^{n+1}}{1 - 2} = 2^{n+1} - 1$

$$k = \log_2(2^k) \leq \log_2 n \leq \log_2(2^{kn}) = k+1$$

$$k \leq \log_2 n$$

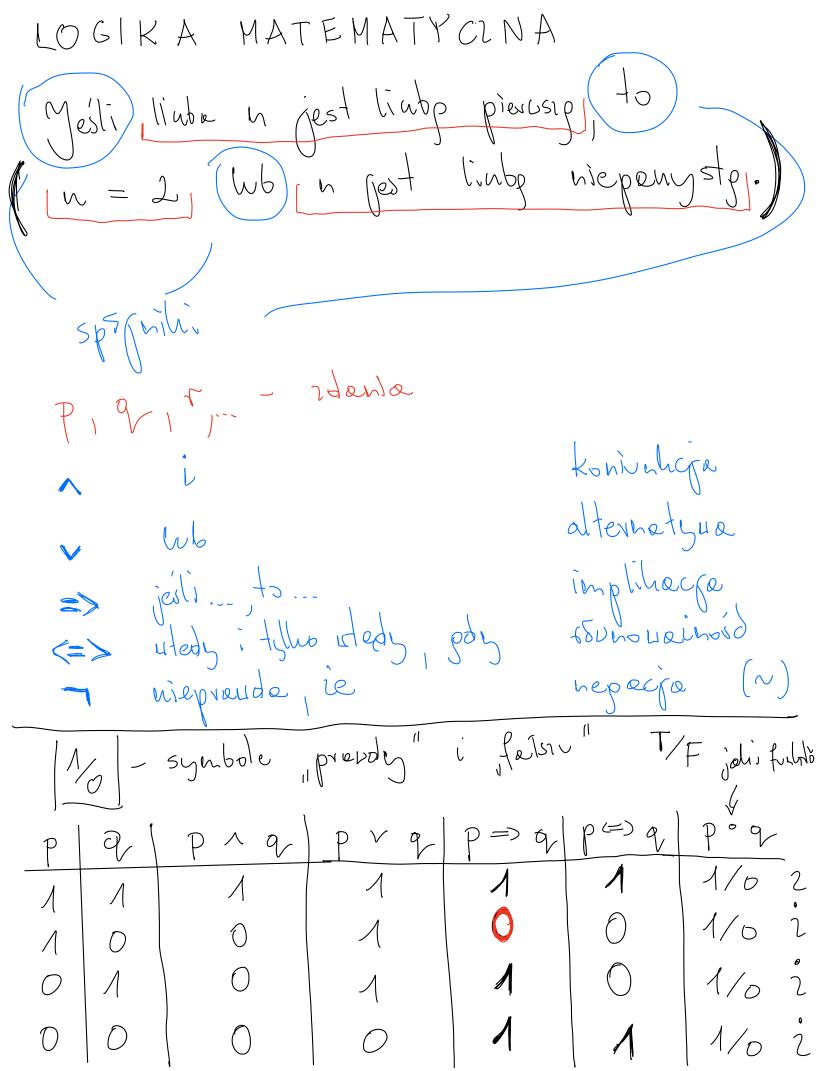
$$(k+1) \leq \log_2 n + 1$$

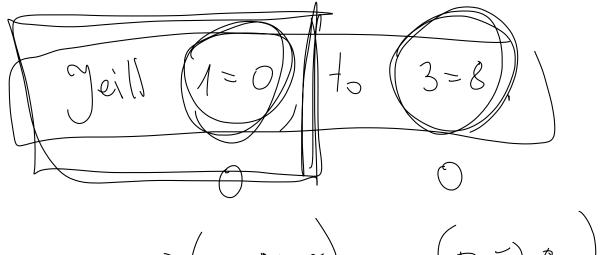
$$2(\log_2 n + 1) - \text{ognaninenie liches}$$

$$2(\log_2 n + 1) - 2(\log_2(2^{kn}) + 1) = 2(\log_2 n + 1) = 2(\log_2 n + 1)$$

$$+ 2^{2n-2} \qquad 2(\log_2(2^{2n-2}) + 1) = 2(\log_2 n + 1) = 2(\log_2 n + 1)$$

$$+ 2^{2n-2} \qquad 2(\log_2(2^{2n-2}) + 1) = 2(\log_2 n + 1) = 2(\log_2 n$$





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