10 PIOTR GUNIA

Z: f - wielomian stopnia k $\quad f(n) = a_0 n^0 + a_1 n^1 + \dots + a_k n^k$

g - wielomian stopnia l $\quad g(n) = b_0 n^0 + b_1 n^1 + \dots + b_k n^k + \dots + b_l n^l$

$k < l$

T: $f(n) = o(g(n))$

$f(n) = o(g(n))$ wtw $\lim\limits_{n\to\infty} \dfrac{f(n)}{g(n)} = 0$

$$\lim_{n\to\infty} \frac{f(n)}{g(n)} = \lim_{n\to\infty} \frac{a_0 n^0 + a_1 n^1 + \dots + a_k n^k}{b_0 n^0 + b_1 n^1 + \dots + b_k n^k + \dots + b_l n^l} =$$

$$= \lim_{n\to\infty} \frac{\frac{n^l}{n^l}}{\frac{n^l}{n^l}} \cdot \frac{\frac{a_0}{n^l} + \frac{a_1}{n^{l-1}} + \dots + \frac{a_k}{n^{l-k}}}{\frac{b_0}{n^l} + \frac{b_1}{n^{l-1}} + \dots + \frac{b_k}{n^{l-k}} + \dots + \frac{b_l n^l}{n^l}} = 0 \qquad l - k \geq 1$$

$\frac{a_0}{n^l} \to 0$, $\frac{a_1}{n^{l-1}} \to 0$, $\frac{a_k}{n^{l-k}} \to 0$

$\frac{b_0}{n^l} \to 0$, $\frac{b_1}{n^{l-1}} \to 0$, $\frac{b_k}{n^{l-k}} \to 0$, $\frac{b_l n^l}{n^l} \to b_l$