

Solution (#275) Let $a > 0$ and let n be a natural number. The coefficient c_k of x^k in $(1 + ax)^n$ is given by

$$c_k = \binom{n}{k} a^k.$$

With some rearranging we see

$$c_k \leq c_{k+1} \iff \frac{na - 1}{1 + a} \geq k.$$

Thus the c_k will increase while $k \leq (na - 1) / (1 + a)$ and decrease subsequently.