Задача 3. Покажите, что последовательность $b_n = (1 - \frac{1}{n})^n$ возрастающая.

(1+x)^k>=1+kx k∋N,x>=-1
bn=(1-1/n)^n
b(n+1)=(1-1/(n+1))^(n+1)

b(n+1)/bn=(1-1/(n+1))^(n+1) / (1-1/n)^n=
=((n+1-1)/(n+1))^(n+1) / ((n-1)/n)^n=
=(n/(n+1))^(n+1) * (n/(n-1))^n=
=n^(n+1)n^n/[(n+1)^(n+1)*(n-1)^n]=n^(2n+1) / [(n+1)^(n+1)*(n-1)^n]=n^(2n+1) / [(n+1)*(n+1)^n*(n-1)^n]=
=n^(2n+1) / [(n+1)*[(n+1)*(n-1)]^n]=n^(2n+1) / [(n+1)*(n^2-1)^n]=n* n^2n / [(n+1)*(n^2-1)^n]=n/(n+1) * [n^2 / (n^2-1)]^n =
=n/(n+1) * [(n^2 -1 +1) / (n^2-1)]^n = n/(n+1) * [1 + 1/ (n^2-1)]^n >= по неравенству Бернулли >=n/(n+1) * (1+n / (n^2-1)) >n/(n+1) * (1+n / n^2) =
n/(n+1) * (1+1 / n) =n/(n+1) * ((n+1) / n) = 1

b(n+1)/bn > 1