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upper and lower bounds to binomial coefficient

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Given two integers $n, k > 0$ such that $k \leq n$, we have the following inequalities for the binomial coefficient $\binom{n}{k}$:

$$\begin{aligned}\binom{n}{k} &\leq \frac{n^k}{k!} \\ \binom{n}{k} &\leq \left(\frac{n \cdot e}{k}\right)^k \\ \binom{n}{k} &\geq \left(\frac{n}{k}\right)^k\end{aligned}$$

Here e is the base of natural logarithms. Also, for large n , $\binom{n}{k} \approx \frac{n^k}{k!}$.