For any integer $n\geq 0$ and any fixed real number $r\ne 1$ and $r\ne 0$, prove that

$$\sum\_{i=0}^{n}r^{i}=\frac{1-r^{n+1}}{1-r}$$

For $n\geq 1$, prove that

$$\sum\_{r=0}^{n}\left(\genfrac{}{}{0pt}{}{n}{r}\right)=\left(\genfrac{}{}{0pt}{}{n}{0}\right)+\left(\genfrac{}{}{0pt}{}{n}{1}\right)+…+\left(\genfrac{}{}{0pt}{}{n}{n}\right)=2^{n}$$