

$$\text{In[*]:= Simplify@Sum}\left[\frac{(1-q)^k x^k}{1-q^k}, \{k, 1, n\}\right]$$

$$\text{Out[*]:= } \sum_{k=1}^n \frac{(1-q)^k x^k}{1-q^k}$$

$$\text{In[*]:= Sum}\left[\frac{(1-q)^k x^k}{1-q}, \{k, 1, n\}\right]$$

$$\text{Out[*]:= } -\frac{x(-1+(1-q)^n x^n)}{1-x+qx}$$

$$\text{In[*]:= Simplify@Sum}\left[\frac{(1-q)^k x^k}{1-q^k}, \{k, 1, \infty\}\right]$$

$$\text{Out[*]:= } \sum_{k=1}^{\infty} \frac{(1-q)^k x^k}{1-q^k}$$