

$$\frac{b_n}{b_{n-1}} = \frac{a_n \cdot a_{n+1} \cdots a_{n+k-1}}{a_{n-1} \cdot a_n \cdots a_{n+k-2}} = \cancel{a_n} \cdot \cancel{a_{n+1}} \cdots \cancel{a_{n+k-1}} = q \cdot q \cdots q = q^k$$