

$$\binom{n}{k} = \frac{n}{1} \cdot \frac{n-1}{2} \cdot \dots \cdot \frac{n-k+1}{k} = \frac{n \cdot (n-1) \cdot \dots \cdot (n-k+1)}{k!} = \prod_{i=1}^k \frac{n+1-i}{i}$$