$$\binom{n}{k} = \frac{n!}{(n-k)!\,k!}$$

$$\frac{\cancel{1\cdot 2\cdot 3\cdot 4\cdot 5\cdot \ldots \cdot n}}{\cancel{1\cdot 2\cdot 3\cdot \ldots}\cdot k\cdot(1\cdot 2\cdot 3\cdot \ldots (n-k))}$$

$$= \frac{(k+1)\cdot(k+2)(k+3)\ldots \cdot n}{1\cdot 2\cdot 3\cdot \ldots\cdot (n-k)} = \binom{n}{k} = \prod_{i=1}^{n-k} \frac{k+i}{i}$$

$$\binom{n}{k} = \binom{n}{n-k} \qquad \binom{100}{95} = \binom{100}{5}$$

$$\binom{n}{k} = \frac{n!}{(n-k)!\,k!}$$

$$\binom{n}{n-k} = \frac{n!}{\cancel{(n-(n-k))}!\,(n-k)!}$$

$k!$

$$\binom{n}{k} = \binom{n}{n-k} = \prod_{i=1}^{\min(n-k,\,k)} \frac{k+i}{i}$$

$$\prod_{i=1}^{k} \quad \frac{n}{1} \cdot \frac{n-1}{2} \cdot \frac{n-2}{3}$$

$$\prod_{i=1}^{k} \frac{n-(i-1)}{i}$$