Question #74651 - Math - Calculus

prove that nCr+1=nCr (n-r/r+1)

Solution: The number of r-combinations from a given set S of n elements is

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

The number of (r+1)-combinations from a given set S of n elements is

$$nC_{r+1} = \binom{n}{r+1} = \frac{n!}{(r+1)!\,(n-r-1)!} = \frac{n!}{(r+1)r!\,(n-r-1)!} \cdot \frac{n-r}{n-r}$$
$$= \frac{n!}{r!\,(n-r)!} \cdot \frac{n-r}{r+1} = \binom{n}{r}\frac{n-r}{r+1} \quad or \quad nC_r(n-r)/(r+1)$$