

Question #74651 - Math - Calculus

prove that $nC_{r+1} = nC_r (n-r/r+1)$

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

$$\begin{aligned} nC_{r+1} &= \binom{n}{r+1} = \frac{n!}{(r+1)!(n-r-1)!} = \frac{n!}{(r+1)r!(n-r-1)!} \cdot \frac{n-r}{n-r} \\ &= \frac{n!}{r!(n-r)!} \cdot \frac{n-r}{r+1} = \binom{n}{r} \frac{n-r}{r+1} \quad \text{or} \quad nC_r (n-r)/(r+1) \end{aligned}$$

Answer provided by <https://www.AssignmentExpert.com>