

Göçer Bayraktar
FE 3d
Exo 1

$$j) \sum_{k=0}^n \binom{n+1}{k+1} a^k b^{n-k}$$

On pose $j = k+1$ $\begin{cases} k=0 \rightarrow j=1 \\ k=n \rightarrow j=n+1 \end{cases}$

$$= \sum_{j=1}^{n+1} \binom{n+1}{j} a^{j-1} b^{n-(j-1)}$$

$$= \sum_{j=0}^{n+1} \binom{n+1}{j} a^{j-1} b^{n+1-j} - \frac{1}{a} b^{n+1}$$

$$= \frac{1}{a} \sum_{j=0}^{n+1} \binom{n+1}{j} a^j b^{n+1-j} - \frac{1}{a} b^{n+1}$$

$$= \frac{1}{a} \times (a+b)^{n+1} - \frac{1}{a} b^{n+1}$$

$$= \frac{(a+b)^{n+1} - b^{n+1}}{a}$$