$$= \sum_{t=0}^{n} \begin{bmatrix} n \\ t \end{bmatrix} \cos(n-2t)\theta = 2\sum_{0\le 2t\le n}{}' \begin{bmatrix} n \\ t \end{bmatrix} \cos(n-2t)$$

<u>Problem:</u> Suppose (where Σ' means that if n is even the term with $t=\frac{n}{2}$ is mult. by $1/2$)

$$\sum_{n=0}^{\infty} a_n A_n(\theta) = b_0 + \sum_{n=1}^{\infty} 2 b_n \cos n\theta \quad (\text{for } \theta \in \mathbb{R})$$

Find identities for the a_n's in terms of the b_n's & vice versa.

$$\sum_{n=0}^{\infty} a_n \sum_{0\le 2t\le n}{}' 2 \begin{bmatrix} n \\ t \end{bmatrix} \cos(n-2t) = b_0 + \sum_{n=1} 2b_n \cos n\theta$$

$$b_0 = \sum_{n=0}^{\infty} \begin{bmatrix} 2n \\ n \end{bmatrix} a_{2n}$$

and

(*) $$b_r = \sum_{t\ge 0} \begin{bmatrix} r+2t \\ t \end{bmatrix} a_{r+2t}$$

$(n-2t=r,\ n=r+2t)$

Suppose we formally invert (*):

(**) $$a_r = \sum_{h\ge 0} T(r,h)\, b_{r+h}$$

We substitute (**) into (*):