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$$T_0(x) = 1$$

$$T_1(x) = x$$

$$T_n(x) = 2x \cdot T_{n-1}(x) - T_{n-2}(x)$$

$$B_{n+2} = B_{n+1} = 0$$

$$b_n = 2x\, B_{n+1} - B_{n+2} + b_n$$

$$\boxed{w(x) = \sum_{k=0}^{n} b_k T_k(x) \quad \Rightarrow \quad w(x) = \frac{B_0 - B_2}{2}}$$

$$b_n = B_n - 2x\, B_{n+1} + B_{n+2}$$

$$\sum_{k=0}^{n}{}' \left(B_k - 2x\, B_{k+1} + B_{k+2}\right) T_k(x) =$$

$$\sum_{k=0}^{n}{}' B_k T_k(x) - 2x \sum_{k=0}^{n}{}' B_{k+1} T_k(x) + \sum_{k=0}^{n}{}' B_{k+2} T_k(x) =$$

$$\frac{1}{2} B_0 T_0(x) + B_1 T_1(x) + \sum_{k=2}^{n} B_k T_k(x) -$$

$$\times B_1 T_0(x) + 0 - 2x \sum_{k=1}^{n-1} B_{k+1} T_k(x) -$$

$$\frac{1}{2} B_2 T_0(x) + 0 + 0 + \sum_{k=0}^{n-2} B_{k+2} T_k(x) =$$

$$\frac{1}{2} B_0 + \cancel{x B_1} - \cancel{x B_1} - \frac{1}{2} B_2 +$$

$$\sum_{k=0}^{n-2} B_{k+2} T_{k+2}(x) - 2x \sum_{k=0}^{n-2} B_{k+2} T_{k+1}(x) + \sum_{k=0}^{n-2} B_{k+2} T_k(x) =$$

przeindeksowuję

$$\frac{B_0 - B_2}{2} + \sum_{k=0}^{n-2} B_{k+2} \left(T_{k+2}(x) - \overbrace{2x\, T_{k+1}(x) + T_k(x)}^{T_{k+2}(x)}\right) = \frac{B_0 - B_2}{2}$$