

Given the generating function for the Tchebysheff polynomials:

$$\frac{1 - xt}{1 - 2xt + t^2} = \sum_{n=0}^{\infty} T_n(x)t^n$$

show that

(a) $T_n(1) = 1$ and $T_n(-1) = (-1)^n$.

(b) $T_{2n}(0) = (-1)^n$ and $T_{2n+1}(0) = 0$.