Homework assignment #2

Math 317

Due Feb 18

Solve the following problems from the textbook:

1. p. 21 ex. 9
2. p. 22 ex. 11. These polynomials are called **Chebishev**[1] **polynomials**. Also find how many solutions to $T_n(x) = 0$ are there for real $-1 \leq x \leq 1$.
3. p. 31 ex. 1-3, 10
4. p. 42 ex. 7
5. p. 54 ex. 7,9

Additional questions:

1. prove that for any nonconstant polynomial $p(z) = a_n z^n + a_{n-1} z^{n-1} + \cdots + a_0$ one has that $p(z) \to \infty$ as $z \to \infty$.
2. Consider $f(z) = e^{1/z}$.
   (a) What is the image under f of the deleted neighborhood $0 < z < \delta$ for $\delta > 0$?
   (b) does $\lim_{z \to 0} f(z)$ exist (either finite or ∞)? If so what is it.

[1] other spellings are also common