Homework 5
Due: Friday, September 22

1. [BC] 17.1, 17.2.

2. [BC] 17.5.

3. (a) [BC] 19.2.a
   (b) Show that the j^{th} derivative of P, evaluated at 0, is
   $$P^{(j)}(0) = j!a_j.$$

4. Consider the function $f(z) = \overline{z}$.
   (a) Prove that f is continuous everywhere.
   (b) Prove that f is not differentiable anywhere.

5. Let $P(z) = (z - z_1) \cdots (z - z_n)$. Prove, by induction on the degree n, that
   $$\frac{P'(z)}{P(z)} = \frac{1}{z - z_1} + \frac{1}{z - z_2} + \cdots + \frac{1}{z - z_n}.$$