# Homework assigned Monday, January 23.

**Problem** 1. Find the expansions of the following about the indicated points. (When we say expand about $z = a$, we mean to expand in powers of $(z-a)$.)

(a) $f(z) = \dfrac{7}{1+z}$ about $z = 5$.

(b) $f(z) = \dfrac{3z^2}{4z+1}$ about $z = i$.

(c) $f(z) = \dfrac{7}{z}$ about $z = 2 + 3i$.

**Problem** 2. Prove

$$\binom{n}{k} + \binom{n}{k+1} = \binom{n+1}{k+1}.$$

**Problem** 3. Use the binomial theorem to expand the following:

(a) $(1 + 3z)^n$.

(b) $(1 - 2z^2)^n$.

(c) $(2 + 2z)^{n+4}$.