# Oblig 1

Oskar Idland

## Problem 1

### a)

### b)

### c)

### d)

## Problem 2

### a)

We begin with the convergence test.

$$\lim_{n\to\infty}\left|\frac{a_{n+1}}{a_n}\right| < 1$$

$$\lim_{n\to\infty}\left|\frac{3^n(z+4-2i)^{2n+2}}{3^{n+1}(z+4-2i)^{2n}}\right| = \lim_{n\to\infty}\left|\frac{(z+4-2i)^2}{3}\right| < 1$$

$$\lim_{n\to\infty}|z+4-2i| < \sqrt{3}$$

### b)

$$\lim_{n\to\infty}\left|\frac{(z-3+i)\,(n^2+2n)}{(n+1)^2+4n^2}\right| = \lim_{n\to\infty}\left|\frac{(z-3+i)(n^2+2n)}{n^2+2n+1+4n^2}\right|$$

### c)

$$\lim_{n\to\infty}\left|\frac{\ln(n+1)nz^{n+1}}{\ln(n)z^n(n+1)}\right| < 1$$

## Problem 3

### a)

### b)

### c)