Recitation #17: The Ratio and Root Tests and Comparison Tests

Group work:

Problem 1 *Determine if the following series converge or diverge.*

(a) $\displaystyle\sum_{n=1}^{\infty} \frac{(7n+1)^2 \cdot 2^n}{5^n}$

(b) $\displaystyle\sum_{n=1}^{\infty} a_n$, *where* $a_{n+1} = \frac{2n+5}{3n-1} \cdot a_n$ *and* $a_1 = 1$.

(c) $\displaystyle\sum_{n=0}^{\infty} \frac{n^2+2n+1}{3n^2+1}$

(d) $\displaystyle\sum_{n=2}^{\infty} \frac{1}{n(\ln n)^2}$

(e) $\displaystyle\sum_{k=1}^{\infty} \frac{(k!)^3}{(3k)!}$

Problem 2 *How many terms are needed to estimate* $\displaystyle\sum_{k=1}^{\infty} \frac{1}{k^2+1}$ *to within* 10^{-4}*? What is the estimate for the sum of the series?*
