Seminar 3

1. Find the sum for each of the following series:

(a) $\sum_{n\geq 1} \frac{2}{3^n}$.

(b) $\sum_{n\geq 1} \frac{2n+1}{n!}$.

(c) $\sum_{n\geq 1} \frac{1}{4n^2-1}$.

(d) $\sum_{n\geq 1} \frac{1}{n(n+1)(n+2)}$.

(e) $\sum_{n\geq 1} \frac{n}{2^n}$.

(f) $\sum_{n\geq 1} \frac{1}{\sqrt[3]{n}}$.

2. Study the convergence of the following series:

(a) $\sum_{n\geq 2} \frac{1}{\ln n}$.

(b) $\sum_{n\geq 1} \frac{1}{n\sqrt{n+1}}$.

(c) $\sum_{n\geq 1} \frac{\ln\left(1+\frac{1}{n}\right)}{n}$.

(d) $\sum_{n\geq 1} \frac{n!}{(n+1)^n}$.

(e) $\sum_{n\geq 1} \left(\frac{n}{n+1}\right)^{n^2}$.

(f) $\sum_{n\geq 2} \frac{1}{n\ln(n)}$.

3. Study the convergence of the following series:

(a) $\sum_{n\geq 1} \frac{1\cdot 3\cdot \ldots \cdot (2n-1)}{2\cdot 4\cdot \ldots \cdot 2n}$.

(b) $\sum_{n\geq 1} a^{\ln n}$, $a>0$.

(c) $\sum_{n\geq 1} \frac{a^n n!}{n^n}$ $a>0$.