408L CLASS PROBLEMS

APRIL 17TH, 2020

Problem 1. Determine whether $\sum_{n=0}^{\infty} \frac{n}{n^2+1}$ converges or diverges.

Problem 2. Determine whether $\sum_{n=1}^{\infty} (\frac{n}{n+1})^{n^2}$ converges or diverges.

Problem 3. Determine whether $\sum_{n=1}^{\infty} \frac{1 \cdot 3 \cdot 5 \cdot \ldots \cdot 2n-1}{1 \cdot 4 \cdot 7 \cdot \ldots \cdot 3n-2}$ converges or diverges.

Problem 4. Determine whether $\sum_{n=1}^{\infty} \tan(\frac{1}{n})$ converges or diverges.

Problem 5. Determine whether $\sum_{n=1}^{\infty} (-1)^n n^{-\frac{1}{100}} \log(n)$ converges or diverges.

Problem 6. Determine whether $\sum_{n=1}^{\infty} (\sin(\frac{1}{n}) - \frac{1}{n})^n$ converges or diverges.

Problem 7. Determine whether $\sum_{n=1}^{\infty} 2^{-\log(n)}$ converges or diverges. Determine whether $\sum_{n=1}^{\infty} 3^{-\log(n)}$ converges or diverges.