

MA 2733

Worksheet 5 – September 30, 2015

Name _____

1. For what values of x does it make sense to define $f(x) = \sum_{n=1}^{\infty} \frac{x^n}{n \cdot 2^n}$.

2. (a) Explain in 1-2 sentences why $\frac{1}{n} \geq \frac{1}{n \ln n} \geq \frac{1}{n(\ln n)^2}$ for $n \geq N$. What is N ?

(b) Discuss convergence of $\sum_{n=2}^{\infty} \frac{1}{n \ln n}$.

(c) Discuss convergence of $\sum_{n=2}^{\infty} \frac{1}{n(\ln n)^2}$.

3. Discuss convergence of $\sum_{n=1}^{\infty} \frac{1}{n^2 - \sqrt{n} + 1}$

4. Discuss convergence of $\sum_{n=0}^{\infty} \frac{n}{4^n}$.

(Hint for using Direct Comparison: $4^n = 2^n \cdot 2^n$.

We'll also see an easier way to do this a little bit later on.)

5. Explain why Direct Comparison with $\sum \frac{1}{4^n}$ will not help you in Problem 4.