Math 242: HW 10

Due on Monday, July 28

Summer '14

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Problem 1

Show that $\sum_{n=1}^{\infty} \frac{(-1)^n}{1+\sqrt[3]{n}}$ is a conditionally convergent series.

Problem 2

Show that $\sum_{n=}^{\infty} \frac{(-1)^n}{1+\sqrt[3]{n^4}}$ is an absolutely convergent series.

Problem 3

Determine if the following series are **conditionally convergent, absolutely convergent or divergent**.

$$\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt[3]{n}}$$

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

Problem 3 continued on next page. . .

$$\sum_{n=1}^{\infty} \frac{(-1)^n n}{n+1}$$

$$\sum_{n=1}^{\infty} \frac{(-10)^n}{n!}$$

$$\sum_{n=1}^{\infty} \frac{(-1)^n n!}{(2n)!}$$

$$\sum_{n=1}^{\infty} \frac{\sin\left((-1)^n n^{15}\right)}{n^3}$$

$$\sum_{n=1}^{\infty} \frac{(-1)^n n!}{(2n)!}$$

$$\sum_{n=1}^{\infty} \frac{(-1)^n (2n)!}{(n!)^2}$$

$$\sum_{n=1}^{\infty} \frac{(-1)^n \ln(n)}{n - \ln(n)}$$

Problem 4

Give an example of two convergent series, $\displaystyle\sum_{n=1}^{\infty} a_n$ and $\displaystyle\sum_{n=1}^{\infty} b_n$, such that $\displaystyle\sum_{n=1}^{\infty} a_n b_n$ does not converge.

Problem 5

Give an example of two divergent series, $\displaystyle\sum_{n=1}^{\infty} a_n$ and $\displaystyle\sum_{n=1}^{\infty} b_n$, such that $\displaystyle\sum_{n=1}^{\infty} a_n b_n$ converges.