

MAT 137

HW #6

Name _____

04/03/09 (due Friday 04/10/09)

10 points

Show work or otherwise justify your answers. Unsupported answers (i.e. calculator output) will not receive full credit. You may check your answers with a calculator or computer.

1. Determine which series converge. Use convergence tests to prove your answers.

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

(b) $\sum_{n=1}^{\infty} \frac{n^2 2^n}{n!}$ Hint: Ratio test.

(c) $\sum_{n=2}^{\infty} \frac{1}{n [\ln(n)]^2}$

(d) $\sum_{n=2}^{\infty} \frac{1}{(\ln(n))^2}$ Hint: Comparison test.

$$(e) \sum_{n=1}^{\infty} \frac{n^2}{\sqrt{n^3+1}}$$

2. Determine which series converge conditionally and which converge absolutely. Use convergence tests to prove your answers.

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

$$(b) \sum_{n=1}^{\infty} (-1)^{n-1} \frac{n^3}{2^n}$$

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

3. For what values of x does the series $\sum_{n=1}^{\infty} \frac{(2x)^n}{n+1}$ converge?

Hint: Ratio test.