

## Math 2260 HW #12

Due 10:10 AM Friday, April 6

**Reading:** Hass §9.7–9.8

**Problems:** Do the assignment “HW12” on WebWork. In addition, write up solutions to the following problems and hand in your solutions in class on Friday.

1. Does the series

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

converge or diverge? Explain your answer.

2. For each positive integer  $n$ , let

$$a_n = \begin{cases} \frac{n}{2^n} & \text{if } n \text{ is a prime number} \\ \frac{1}{2^n} & \text{otherwise.} \end{cases}$$

Does the series  $\sum_{n=1}^{\infty} a_n$  converge or diverge? Explain your answer.

3. Does the series

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

converge absolutely, converge conditionally, or diverge? Explain your answer.