Each problem is worth 5 points. Clear and complete justification is required for full credit.

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

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