Problems. January 13.

1. Test the series for convergence or divergence

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

2. Test the series for convergence or divergence

$$\sum_{n=1}^{\infty} \left(\frac{1}{n}\right)^{\frac{1}{\sqrt{n}}}.$$

3. Test the series for convergence or divergence

$$\sum_{n=1}^{\infty} \ln \frac{n+1}{n+2}.$$

4. Use the integral test to determine whether the series

$$\sum_{n=1}^{\infty} \frac{n}{n^2+1}$$

converges or diverges.