Problems. January 20.

1. Test the series for convergence or divergence

$$\sum_{n=1}^{\infty} \frac{(3n)!}{3^n (n!)^3}.$$

2. Test the series for convergence or divergence

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

3. Test the series for convergence or divergence

$$\sum_{n=1}^{\infty} \left(1 - \frac{2}{n}\right)^{n^2}.$$

4. Test the series for convergence or divergence

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