Problem 1. Determine if the series $\sum_{n=2}^{\infty} \frac{(-1)^n \ln^2(n)}{n}$ converges or diverges. Justify your answer, and specifically state what test(s) you are using.

Problem 2. Determine if the series $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{2^{3/(n^2+1)}}{n}$ converges or diverges. Justify your answer, and specifically state what test(s) you are using.