Problem 1. Determine if the series $\sum_{n=31}^{\infty} \frac{\sin^2(n)}{1 + 3^n}$ converges or diverges. Justify your answer, and specifically state what test(s) you are using.

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