Problem statement Use the comparison or limit comparison test to decide if the following series converge.

$$\sum_{n=1}^{\infty} \frac{4 - \sin n}{n^2 + 1} \; ; \qquad \sum_{n=1}^{\infty} \frac{4 - \sin n}{2^n + 1} \; .$$

For each series which converges, give an approximation of its sum, together with an error estimate, as follows. First calculate the sum s_5 of the first 5 terms, Then estimate the "tail" $\sum_{n=6}^{\infty} a_n$ by comparing it with an appropriate improper integral or geometric series.