Tests for Convergence

Determine whether the following series converge. Justify your answer.

1) $\sum \dfrac{1}{k^2 + 2k}$

2) $\sum \dfrac{(n!)^2}{(2n)!}$

3) $\sum \dfrac{1}{k(\ln k)^2}$

4) $\sum \dfrac{n}{n^2 + 5}$

5) $\sum (\dfrac{\ln n}{n})^n$

4) How many terms should you add up in $\sum \dfrac{1}{n^4}$ to be within 0.0005 of the actual sum?