Using the Ratio Test – Use the Ratio Test to determine whether the following series converge

1. $\displaystyle\sum_{k=1}^{\infty} \frac{(k+2)!}{k!}$

2. $\displaystyle\sum_{k=1}^{\infty} \frac{k!}{(k+1)!}$

Using the Root Test – Use the Root Test to determine whether the following series converge

3. $\displaystyle\sum_{k=1}^{\infty} \frac{2^k}{k^{10}}$

Using the Comparison Test – Determine whether the following series converge

4. $\displaystyle\sum_{k=1}^{\infty} \frac{k^3}{2k^4 - 1}$

5. $\displaystyle\sum_{k=1}^{\infty} \frac{\ln k}{k^3}$

Alternating Series Test – Determine the following series converge or diverge

6. $\displaystyle\sum_{k=1}^{\infty} \frac{(-1)^{k+1}}{k^2}$

7. $\displaystyle\sum_{k=1}^{\infty} \frac{(-1)^k \ln k}{k}$