Series Practice Problems

Determine if the following series converge or diverge.

1. $\sum_{n=1}^{\infty} \frac{1}{n^3+6}$

2. $\sum_{n=8}^{\infty} \frac{\ln^2(n)}{n}$

3. $\sum_{n=1}^{\infty} \frac{n}{\sqrt{n^3+n^2+1}}$

4. $\sum_{n=1}^{\infty}(-1)^n \frac{n^3}{7^{n+7}}$

5. $\sum_{n=1}^{\infty} \frac{n^3+4n^2-3n+8}{8n^2-3n^3+6n-47}$

6. $\sum_{n=1}^{\infty} \frac{(n+1)!}{n^n}$

7. $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n(e^{2\pi n}-1)}$

8. $\displaystyle\sum_{n=1}^{\infty} \ln\left(\frac{n}{2n+1}\right)$

9. $\displaystyle\sum_{n=1}^{\infty} \frac{1\cdot 3\cdot 5\cdot\cdots\cdot(2n-1)}{5^n n!}$