1. **Determine if the following series converge.**

(a) $\displaystyle\sum_{k=1}^{\infty} \frac{7^k}{k! + 10}$

(b) $\displaystyle\sum_{j=1}^{\infty} \left(\frac{e+1}{\pi}\right)^j$

(c) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n n}{n^3 + 1}$

(d) $\displaystyle\sum_{k=1}^{\infty} \frac{5}{2 + \ln k}$

(e) $\displaystyle\frac{1}{1 \cdot 4} + \frac{1}{2 \cdot 7} + \frac{1}{3 \cdot 10} + \frac{1}{4 \cdot 13} + \cdots$

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

(g) $\displaystyle\sum_{k=10}^{\infty} \frac{1}{\sqrt{k(k-9)}}$

(h) $\displaystyle\sum_{k=1}^{\infty} e^{-k^2}$

(i) $\displaystyle\sum_{k=1}^{\infty} \sin\left(\frac{1}{k^3}\right)$

(j) $\displaystyle\sum_{i=2}^{\infty} \frac{\sqrt{i+1}-\sqrt{i}}{\sqrt{i^2-i}}$