1. Consider the series $\sum_{k=1}^{\infty} \dfrac{k}{k^4 + 1}$

   a. Use the Integral Test to show that the series converges
   b. Use Maple to calculate S_{50}
   c. How accurately does S_{50} approximate the exact value of the series?

2. Do the following series converge or diverge?

   a. $\sum_{k=1}^{\infty} \dfrac{\sin(k) + 3}{5k^{17}}$

   b. $\sum_{k=2}^{\infty} \dfrac{1}{k \, \ln(k)}$

   c. $\sum_{k=1}^{\infty} \dfrac{k + 2}{k + 17}$

1. Consider the series $\displaystyle\sum_{k=1}^{\infty} \frac{3^k}{5^k + 17}$

   a. Show that the series converges
   b. Calculate S_{30}
   c. How accurately does S_{50} approximate the exact value of the series?

2. Do the following converge or diverge?

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

   b. $\displaystyle\int_{1}^{\infty} \frac{e^x}{3^{x+1}}\, dx$