1. Determine the radius and interval of convergence for the series.

   (a) $\sum_{n=0}^{\infty} \frac{(x+5)^n}{n!}$

   (b) $\sum_{n=0}^{\infty} n!(2x-1)^n$

   (c) $\sum_{n=0}^{\infty} \frac{n(x-2)^n}{2^n(n^2+1)}$

2. Find a power series representation for the function and determine the interval of convergence.

   (a) $\frac{x}{x^2+25}$

   (b) $\frac{x^2}{(1-2x^2)^2}$

   (c) $\ln(5-x)$

   (d) $\arctan(2x)$

   (e) $\ln\left(\frac{1+x}{1-x}\right)$

3. Evaluate the indefinite integral.

   (a) $\int \frac{x\,dx}{1+x^5}$

   (b) $\int \arctan(x^2)\,dx$

4. Approximate the value of the definite integral to six decimal places.

   (a) $\int_0^{0.3} \frac{dx}{1+x^4}$

   (b) $\int_0^{0.2} x\ln(1+x^2)\,dx$

5. Find the Taylor series representation for $f(x)$ centered at the given point.

   (a) $f(x) = \ln x$, $a = 2$

   (b) $f(x) = e^{2x}$, $a = 3$

   (c) $f(x) = \sin(2x)$, $a = \pi$

   (d) $f(x) = \sqrt{x}$, $a = 16$

6. Find the Maclaurin series for $f(x)$.

   (a) $f(x) = x\cos(2x)$

   (b) $f(x) = xe^{-x^2}$

   (c) $f(x) = \sqrt[3]{8+x}$