1. Find a power series representation for each of the following functions and its interval of convergence. (Continued on the next page.)

   (a) $f(x) = \dfrac{1}{3+5x}$

   (b) $f(x) = \dfrac{x^2}{1+x^2}$

   (c) $f(x) = x^3 e^{-x^2}$

(d) $f(x) = \ln(1 - x)$

(e) $f(x) = \tan^{-1}\left(\sqrt{x}\right)$

2. Do #36 in section 11.7.

3. Use an infinite series to approximate the following definite integrals to four significant digits.

(a) $\int_0^1 e^{-x^2}\,dx$

(b) $\int_0^{0.2} \frac{x^3}{1+x^5}\,dx$