1. Find a power series representation for the function and determine the interval of convergence. $f(x) = \dfrac{x}{1+x^2}$

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

   a) $f(x) = \ln(1 - x^2)$

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

3. Find the Taylor series for f(x) centered at the given value of a.

a) $f(x) = \dfrac{1}{x^2}$, $a = 1$

b) $f(x) = xe^x$, $a = 2$

5. Find the Maclaurin series of f and its radius of convergence. $f(x) = \sqrt{4-x}$

6. Evaluate the indefinite integral as an infinite series. $\int \cos(x^3)dx$