1. Find the radius of convergence and interval of convergence of the series. (4 points each)

   a. $\sum_{n=1}^{\infty} \frac{(3x)^n}{n!}$

   b. $\sum_{n=1}^{\infty} \frac{(x-3)^n}{4^n(n+1)}$
2. Find the radius of convergence and interval of convergence of the series. (4 points each)

a. $\sum_{n=1}^{\infty} n! (x - 5)^n$

b. $\sum_{n=1}^{\infty} \frac{3^n}{n^3} (x - 2)^n$
3. Find a power series representation for the function. Simplify your answer. (Show the steps required to find this series from a known series.) (2 points each)

a. \( f(x) = \frac{3}{1 - x^4} \)

b. \( f(x) = \frac{x}{2x^2 + 1} \)

c. \( f(x) = \frac{x^2}{27 - x^3} \)