1. Find the Maclaurin series of $f(x) = \sin^2 x$.

2. Find the Maclaurin series of $f(x) = \tan x$.

3. Find the Maclaurin series of

$$f(x) = \begin{cases} e^{-1/x^2} & \text{for } x \neq 0 \\ 0 & \text{for } x = 0 \end{cases}$$

4. Suppose $f(x) = \sum_{k=0}^{\infty} b_k x^k$ for all real numbers x. Find a formula for b_8.

5. If $f(x) = \dfrac{x^2+1}{\sqrt[3]{1+x}}$, find $f^{(10)}(0)$.

6. Evaluate $\lim_{x\to 0} \left(\dfrac{\sin x}{x}\right)^{1/x^2}$.