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

$$\sum_{k=1}^{\infty} \frac{(x - 3)^k}{2^k}.$$ 

2. (a) Write the first four non-zero terms of the Maclaurin series for

$$f(x) = \sin(-x^2).$$

(b) Write the first four non-zero terms of the Maclaurin series for

$$g(x) = \frac{d}{dx}\left(\sin(-x^2)\right).$$