1) Determine the power series expansion for the function $\dfrac{x^2}{1-2x^2}$ and determine its radius of convergence. Explain your reasoning.

2) Find the radius of convergence and the open interval of convergence for the series

$$\sum_{n=1}^{\infty} \frac{(2x+1)^{2n+1}}{n^2+4}.$$