4. (8 points) Show that if $\sum_{n=1}^{\infty} a_n$ converges, then $\lim_{n\to\infty} a_n = 0$.

5. (8 points) In this question we will investigate the convergence of the power series $\sum_{n=0}^{\infty} \frac{n^2}{e^n}(x+2)^n$.

(a) Find the radius of convergence, R, of the power series. (Show your work.)

$R =$ _____.

(b) What is the interval of convergence of the power series?

_____ $<\ x\ <$ _____.