

3. (14 points) Please note that the two parts of this problem involve different power series.

(a) (8 pts.) Use the ratio test to find the *radius of convergence*, R , for the series

$$\sum_{n=0}^{\infty} \frac{3^n}{n!} x^n.$$

Show step-by-step work.

(b) (6 pts.) The power series

$$\sum_{n=0}^{\infty} \frac{(-1)^n (x-1)^n}{2^n n^3},$$

has a radius of convergence $R = 2$ (so we know that this series converges at least on the open interval $(-1, 3)$.) Find the *interval of convergence* for this series. Show step-by-step work.