Homework 3

1. Determine the convergence or divergence of the series using any appropriate test.

(a) $\sum_{k=1}^{\infty} \frac{(-1)^k k}{2^k}$

(b) $\sum_{k=2}^{\infty} \frac{e^{3k}}{k^{3k}}$

2. Find the *n*th Maclaurin polynomial and approximate at the given value of x for the function.

(a) $f(x) = xe^x\,, \quad n = 5\,, \quad f(\frac{1}{4})$

(b) $f(x) = \frac{x}{x+1}\,, \quad n = 4\,, \quad f(1)$

3. Find the radius of convergence of the power series.

(a) $\sum_{k=0}^{\infty} k!\,(x-5)^k$

(b) $\sum_{k=1}^{\infty} \frac{x^k}{k4^k}$