Assignment #9 **Name** _____

Due 25 March 2015

1. Consider the infinite series $\sum_{k=1}^{\infty} ke^{-k}$.

   (a) Evaluate $\int xe^{-x}dx$.

   (b) Show that the two conditions of the integral test are satisfied by the series and show that the series converges.

(c) Let L denote the sum of the series and let $s_n = \sum_{k=1}^{n} ke^{-k}$ be the nth partial sum of the series. Compute s_4, expressing your answer as a decimal.

(d) Find upper and lower bounds for the error in approximating L by s_4.