(10)   1. Give an example of a power series centered at $x = 2$ which has positive coefficients.

(10)   2. Consider the power series $\sum\limits_{n=0}^{\infty} \dfrac{n}{3^n} x^n$.

    (a) Does it converge at $x = 0$?

    (b) Does it converge at $x = 3$?

    (c) Does it converge at $x = -3$?

(10)   3. The Taylor series at 0 for e^x is $\sum\limits_{n=0}^{\infty} \dfrac{x^n}{n!}$.

    (a) Write out the degree three Taylor polynomial for e^x at 0.

    (b) Use the polynomial to approximate e^{-1}