1. Find the two-term asymptotic expansion for small \( \epsilon \) for all real roots \( x \) of the below equations.

(a) \( \epsilon^2 x^3 - x + \epsilon = 0 \)

(b) \( \epsilon \exp(x^2) = 1 + \frac{\epsilon}{1 + x^2} \)

2. The Exponential integral function is defined as

\[
Ei(x) = \int_{x}^{\infty} \frac{\exp(-s)}{s} ds.
\]

Derive an asymptotic expansion for \( Ei(x) \) for large \( x \). Use a computer (e.g. \texttt{expint}(x) in MATLAB) to check the accuracy of your expansion for different values of \( x \) and for different numbers of terms. Discuss your results.