Project 3  
Convergence Rates of Newton’s Method

The equation

\[ 10.62882x^6 + 15.35274x^5 + 2.6244x^4 - 6.9984x^3 - 5.184x^2 - 1.42848x - 0.14336 = 0 \]

has two roots.

1. Use Newton’s Method to calculate both roots to as many correct decimal places as you can.

2. For each root for which Newton’s Method converges quadratically, calculate the ratio

\[ \lim_{i \to \infty} \frac{e_{i+1}}{e_i^2} \]

from the Newton iteration and compare with the theoretical value.

3. For each root for which Newton’s Method converges linearly, calculate the ratio

\[ \lim_{i \to \infty} \frac{e_{i+1}}{e_i} \]

from the Newton iteration and deduce the multiplicity of the root.

Begin your report by answering the questions 1 – 3 above. Print out the Matlab code used and your Matlab session, and include these with your report.

Due: Thurs., July 2