

Homework 1

1. Derive a second order forward approximation for the derivative by the following steps.
 - Write the Taylor's series for $f(x + h)$
 - Write the Taylor's series for $f(x + 2h)$
 - Combine the two equations to obtain an approximation for $f'(x)$ and see that the reminder is $\mathcal{O}(h^2)$.

2.
 - (a) Program the expressions you obtained to a matlab code (add to the file given).
 - (b) Use the two tests provided and show that your program works.
 - (c) Do the two tests converge in the same way? Why?