

**Instructions:** Work together in pairs on the following problem.

1. Let  $f(x) = x^4 - 4x^2 + 4$

(a) Prove that  $f(x)$  has a root on the interval  $[1, 2]$ .

(b) Use Newton's Method to find a root of  $f(x)$  in  $[1, 2]$  to within  $10^{-4}$ .

(c) Use Modified Newton's Method to find a root of  $f(x)$  in  $[1, 2]$  to within  $10^{-4}$ .

(d) Comment on the relative efficiency of these two methods based on these examples.