

FEA Lab 1 – Matlab

1. 2 of 5 tests passed on Matlab grader for problem 1
2. All tests passed on Matlab grader for problem 2
3. All tests passed on Matlab grader for problem 3
4. All tests passed on Matlab grader for problem 4.1, 4.2, and 4.3
5. Below are plots generated for the exact solution, linear approximation, and FEA solution to the uniform bar from problems 1, 3, and 4. The linear approximation is good for determining displacement at the ends of the bar and an average stress and strain values for the bar but is not accurate at other locations when compared to the exact solution. The FEA solution for displacement better matches the exact solution. A solution with more nodes would be better for determining the maximum and minimum stress and strain in the bar. More nodes will always be more accurate in this case. A mesh convergence study could be done to determine the optimum number of nodes to capture most of the exact solution while keeping the computation feasible.

