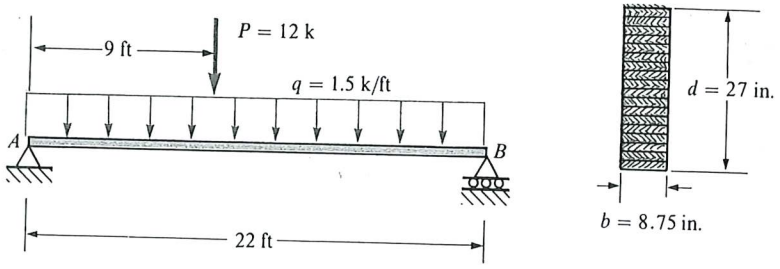
ESM 5734 HW 6
Due on Friday, October 7, 2022 at 11:15 AM

Use 4-noded elements and the associated cubic polynomial FE basis functions that are in H^1 to numerically solve the following beam problem. You should use non-dimensional quantities as discussed in the class on 28 September.

(a) Plot on the same graph the deformed shape of the plate found analytically and numerically,
(b) plot on the same graph the variation of the shear force and the bending moment along the beam,
(c) determine the maximum tensile and compressive stresses in the beam due to bending and state where they occur,
(d) use an error norm of your choice to find the discrepancy in the numerical solution.



Notes:
In the Fig. "k" is for kilo-pounds.

The FE mesh must have a node at the location of the point force, P, that is written as P $\delta(x - x_0)$ in the governing equation and $\delta(x - x_0)$ is the Dirac delta function that equals zero when $x \neq x_0$ and 1 when $x = x_0$. Note that $\int_0^L f(x)\ \delta(x - x_0)dx = f(x_0)$ for $0 < x_0 < L$.