

Department of Aerospace Engineering
AE332 Aerospace Structures II
Assignment No. 4 (Plate Bending)

Consider the rectangular plate shown in figure with a triangular load. This plate is simply supported at $x = 0$ and $x = a$ and is fixed at $y = 0$ and $y = b$. Using the Lévy method, show that

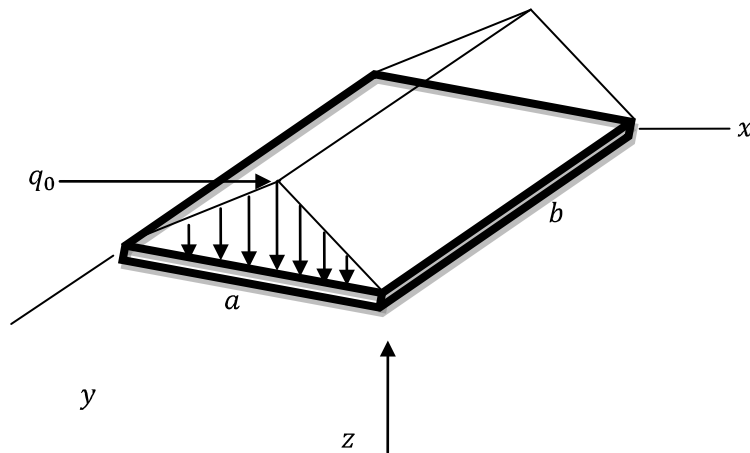
$$q_m = \frac{8q_0}{Dm^2\pi^2} \sin \frac{m\pi}{2}$$

The geometrical and material parameters are:

$$h = 0.03 \text{ m}, a = 0.6 \text{ m}, b = 0.6 \text{ m}$$

$$E = 2.1 \times 10^{11} \text{ Pa}, \nu = 0.3$$

$$q_0 = 7 \times 10^5 \text{ Pa}$$



Write a code to plot the transverse deflection, bending and twisting moments as well as the bending stresses at the top and bottom face of the plate.

Plot these quantities for total number of terms in the expansion with 1, 3, 5 and 7.