

Find the natural frequencies of longitudinal vibration of the stepped bar shown in the figure. Its Young's Modulus is 30×10^6 psi and its density is 0.283 lbf/in^3 . Please show your work and draw a box around your answer to receive full credit.

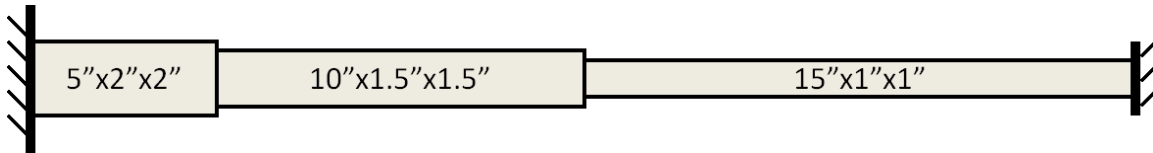


Figure 1. Stepped bar with three segments and fixed at both ends. Dimensions given for each segment are *length* \times *width* \times *height*.