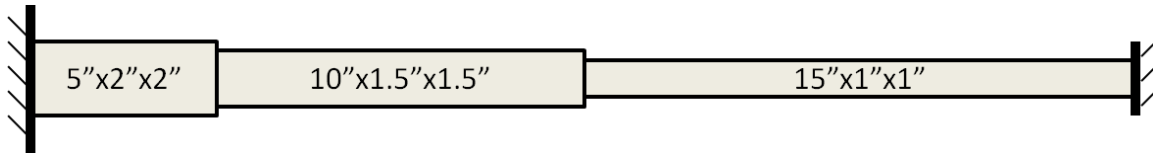


Find the natural frequencies of longitudinal vibration of the stepped bar shown in the figure. Its Young's Modulus is  $30 \times 10^6$  psi and its density is  $0.283 \text{ lbf/in}^3$ . Please show your work and draw a box around your answer to receive full credit.



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