

Physics 101Rec
 Quiz# 9-Sect 04
 Chapter 12

Name: Key Id: _____

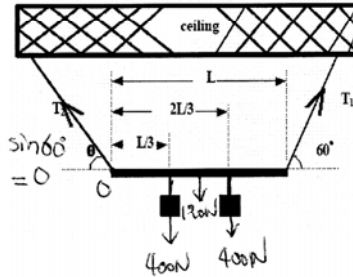
1. A uniform rod of length $L = 1.2$ m and weight 120 N is supported by two ropes. Two 400 N weights are suspended at $L/3$ and $2L/3$ as shown in the figure. Find the tensions T_1 .

$$\sum \tau_o = 0$$

$$\Rightarrow -400 \times \frac{L}{3} - 120 \times \frac{L}{2} - 400 \times \frac{2L}{3} + T_1 \times L \sin 60^\circ = 0$$

$$+ \frac{400}{3} + \frac{120}{2} + 400 \times \frac{2}{3} = T_1 \sin 60^\circ$$

$$T_1 = 531 \text{ N}$$



2. A solid copper cube has a length edge of 95 cm. How much stress must be applied to the cube to reduce the edge length to 90 cm? The bulk modulus of copper is 1.4×10^{11} N/m².

$$\text{stress } P = B \frac{\Delta V}{V} = 1.4 \times 10^{11} \times \frac{\Delta V}{V}$$

$$V = L_0^3 = (0.95)^3 = 0.8574 \text{ m}^3$$

$$\Delta V = (L - L_0)^3 = (0.05)^3 = 1.25 \times 10^{-4} \text{ m}^3$$

$$P = 1.4 \times 10^{11} \times \frac{1.25 \times 10^{-4}}{0.8574} = 2.04 \times 10^7 \text{ Pa}$$