37. (a) We assume the center of mass is closer to the right end of the rod, so the distance from the left end to the center of mass is $\ell = 0.60$ m. Four forces act on the rod: the upward force of the left rope T_L, the upward force of the right rope T_R, the downward force of gravity mg, and the upward buoyant force F_b. The force of gravity (effectively) acts at the center of mass, and the buoyant force acts at the geometric center of the rod (which has length $L = 0.80$ m). Computing torques about the left end of the rod, we find

$$T_R L + F_b\left(\frac{L}{2}\right) - mg\ell = 0 \implies T_R = \frac{mg\ell - F_b L/2}{L} .$$

Now, the buoyant force is equal to the weight of the displaced water (where the volume of displacement is $V = AL$). Thus,

$$F_b = \rho_w g A L = \left(1000\,\mathrm{kg/m^3}\right)\left(9.8\,\mathrm{m/s^2}\right)\left(6.0\times10^{-4}\,\mathrm{m^2}\right)(0.80\,\mathrm{m}) = 4.7\ \mathrm{N} .$$

Consequently, the tension in the right rope is

$$T_R = \frac{(1.6\,\mathrm{kg})\left(9.8\,\mathrm{m/s^2}\right)(0.60\,\mathrm{m}) - (4.7\,\mathrm{N})(0.40\,\mathrm{m})}{0.80\,\mathrm{m}} = 9.4\ \mathrm{N} .$$

(b) Newton's second law (for the case of zero acceleration) leads to

$$T_L + T_R + F_B - mg = 0 \implies T_L = mg - F_B - T_R = (1.6\,\mathrm{kg})\left(9.8\,\mathrm{m/s^2}\right) - 4.69\,\mathrm{N} - 9.4\,\mathrm{N} = 1.6\ \mathrm{N} .$$