

58. (a) Setting up equilibrium of torques leads to a simple “level principle” ratio:

$$F_{\text{catch}} = (11 \text{ kg})(9.8 \text{ m/s}^2) \frac{(91/2 - 10) \text{ cm}}{91 \text{ cm}} = 42 \text{ N} .$$

(b) Then, equilibrium of vertical forces provides

$$F_{\text{hinge}} = (11 \text{ kg})(9.8 \text{ m/s}^2) - F_{\text{catch}} = 66 \text{ N} .$$