

50481, Physics, Mechanics — Kinematics — Dynamics

Question How much force is needed to lift a 10.0 kg mass from a horizontal position using the human arm if the forearm is 25 cm long and the lifting muscle is 2.0 cm from the elbow?

Solution Using lever rule we can find:

$$F_1 L_1 = F_2 L_2$$

$$F_2 = F_1 \frac{L_1}{L_2} = mg \frac{L_1}{L_2} = 10 \cdot 9.8 \frac{25}{2} 1225 \text{ N}$$

So it is needed 1225 N to lift a 10.0 kg mass.