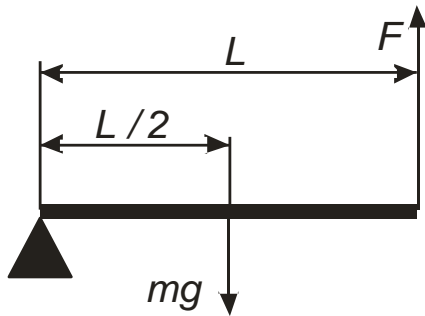


Question#20363

A uniform rod has mass m and length L . One end of the rod is attached to a fixed point O by a hinge and an additional force F is applied to the other end of the rod in the vertical direction (upwards). Given that the rod is in mechanical equilibrium, what is the magnitude of the applied force F , expressed as a numerical multiple of mg , where g is the magnitude of the acceleration due to gravity? (To 3 significant figures).

Solution:



The rod is in mechanical equilibrium its means that (according to the law of the laver):

$$\frac{F}{L} = \frac{mg}{L/2}, \frac{F}{L} = \frac{2mg}{L}$$

$$\frac{F}{L} = \frac{2mg}{L}$$

$$F = 2mg$$

Answer:

$$F = 2mg$$