

20080220-1013
Force of Friction

Answer

If the coef. of static friction is 0.1500, how much force is needed to overcome the force of friction between an object with a mass of 90.00 kg and the horizontal surface it is resting on.

1st Find F_w

$$F_w = mg \\ = (90.00 \text{ kg})(9.800 \frac{\text{m}}{\text{s}^2})$$

$$F_w = 882.0 \text{ n}$$

2nd Find F_N

F_N must equal F_w in magnitude but be up instead of down so

$$F_N = 882.0 \text{ n}$$

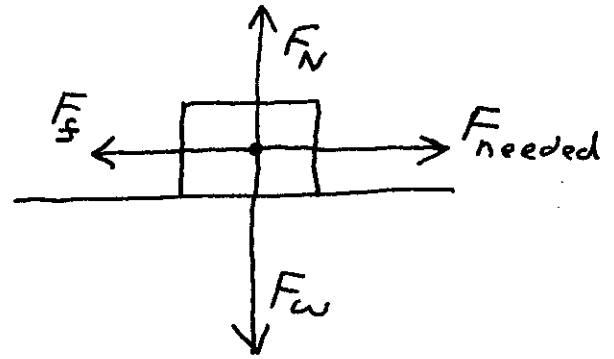
3rd Find F_f using

$$F_f = \mu F_N \\ = (0.1500)(882.0 \text{ n})$$

$$F_f = 132.3 \text{ n}$$

4th Find F_{needed}

The force needed is the same as the F_f plus just enough to get it to move.



Remember:

Friction always opposes motion

$$F_{\text{needed}} = 132.3 \text{ n} \\ \text{to the right}$$