Answer on Question #44154, Physics, Mechanics | Kinematics | Dynamics

If a pushing force making an angle alpha with horizontal is applied on a block of mass m placed on horizontal table and angle of friction is beta ,then minimum of force required to move the block is??

Solution:

Then minimum of force required to move the block is such that its projection is equal to the force of friction :

$$Fcos(\alpha) = F_t$$

From geometry :

$$N = mg - Fsin(\alpha)$$

$$F_t = tg(\beta)N = tg(\beta)(mg - Fsin(\alpha)) = Fcos(\alpha)$$

Then $F = \dfrac{mg \; \sin(\beta)}{\cos(\alpha)\cos(\beta) + \sin(\alpha)\sin(\beta)} = \dfrac{mg \; \sin(\beta)}{\cos(\alpha - \beta)}$