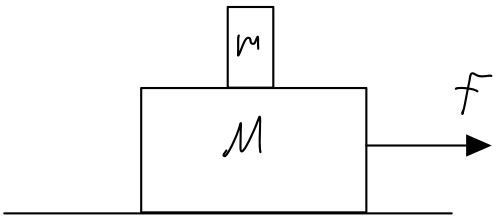
Option 1

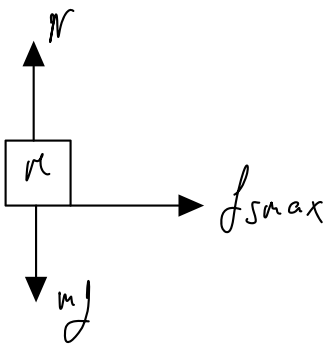
Given μ

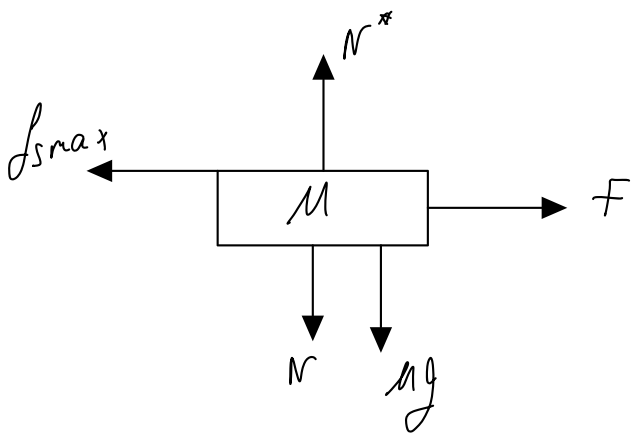


frictionless floor

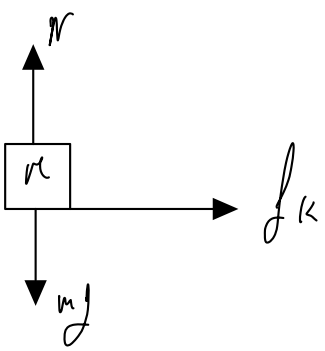
what is the minimum F required to start the block m to slide on block M

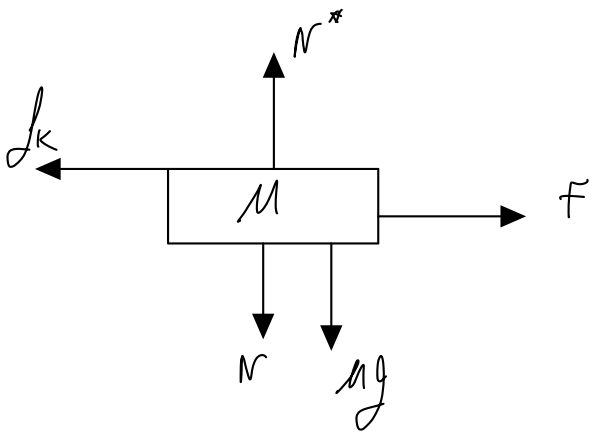
free diagram body





The two blocks will move as 1 block with same acceleration untill $F > f_{smax}$ and:





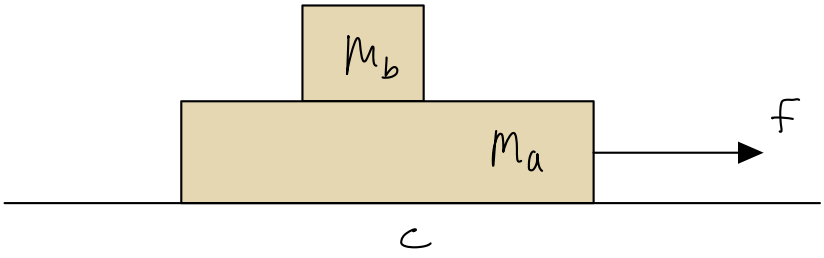
1 $f_{s\,max} = N \cdot \mu_s = \mu_s g (m+M)$

$\Sigma F_{xM} = F - f_{s\,max} = Ma$

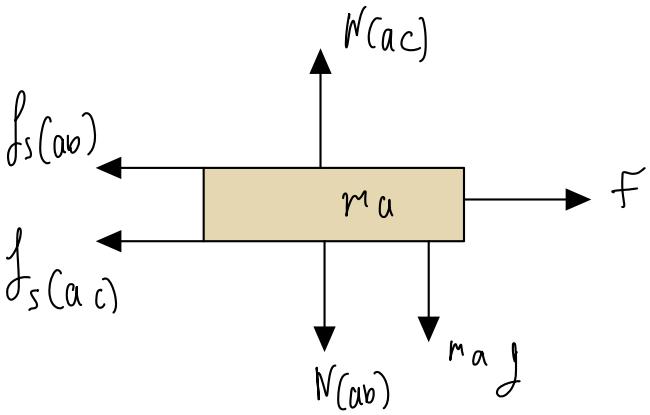
$\Sigma F_{xm} = f_{s\,max} = ma \longrightarrow \frac{f_{s\,max}}{m} = a$

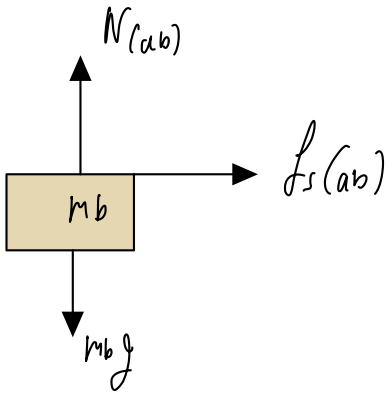
$F = f_{s\,max} + \mu_0 \frac{f_{s\,max}}{m}$

$F = \mu_s g (m+M)\left(1 + \frac{M}{m}\right)$

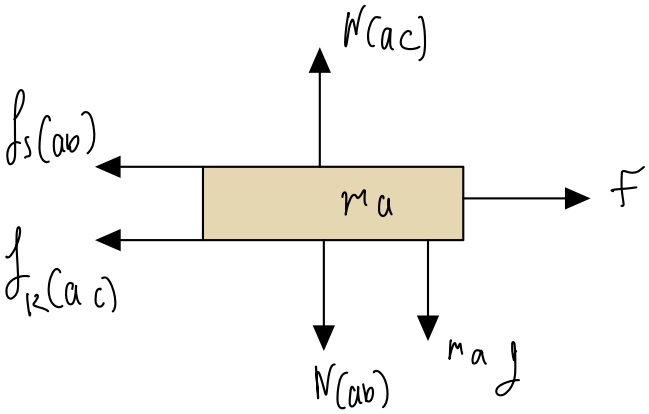


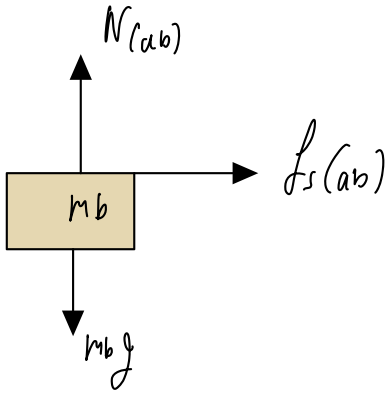
μ_{ac} , μ_{ab}





Option 2 if $f_{s(ab)} > F > f_{s(ac)}$ Then:

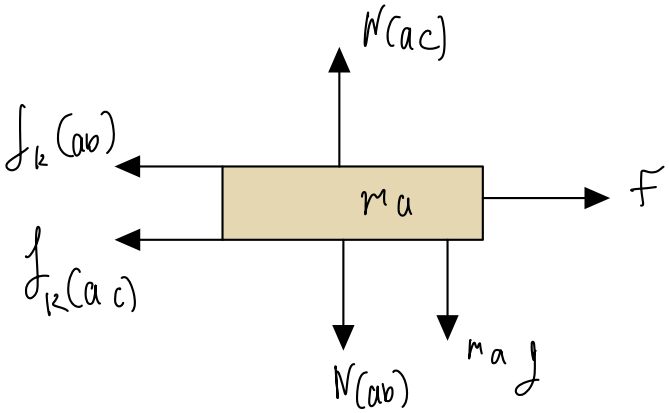


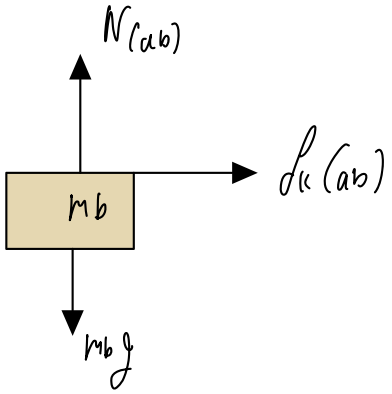


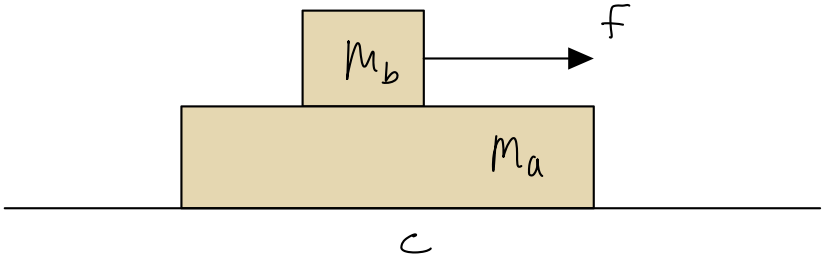
- if $f_{s(ac)} > F > f_{s(ab)}$ then nothing will happen because friction cant cause to movement?

0.3

Q.4 and if $f > f_{s(ab)}$ Then

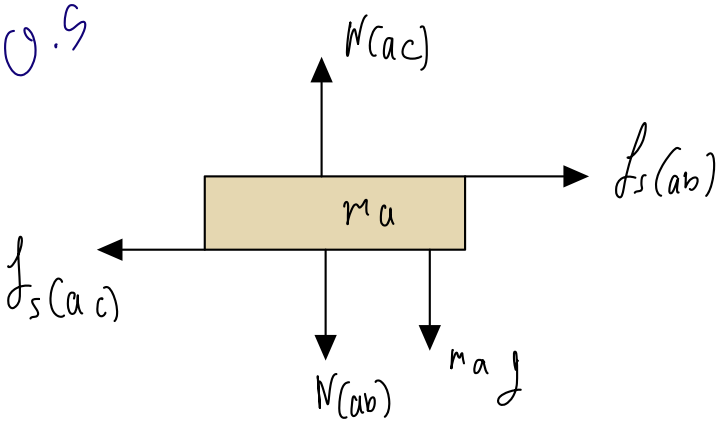


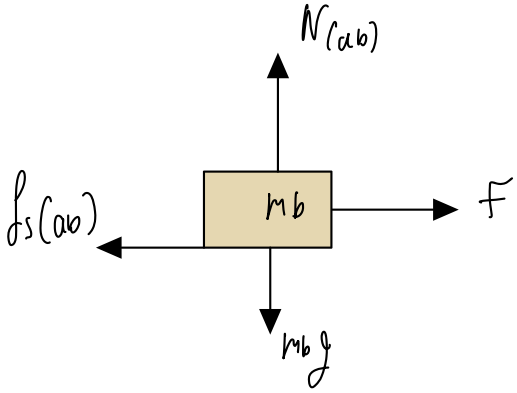




μ_{ac} , μ_{ab}

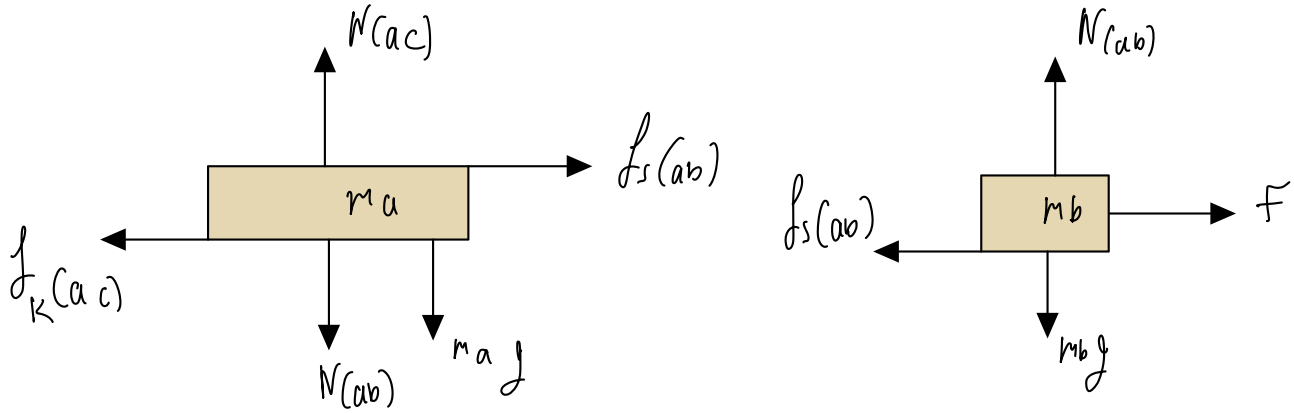
Q.5





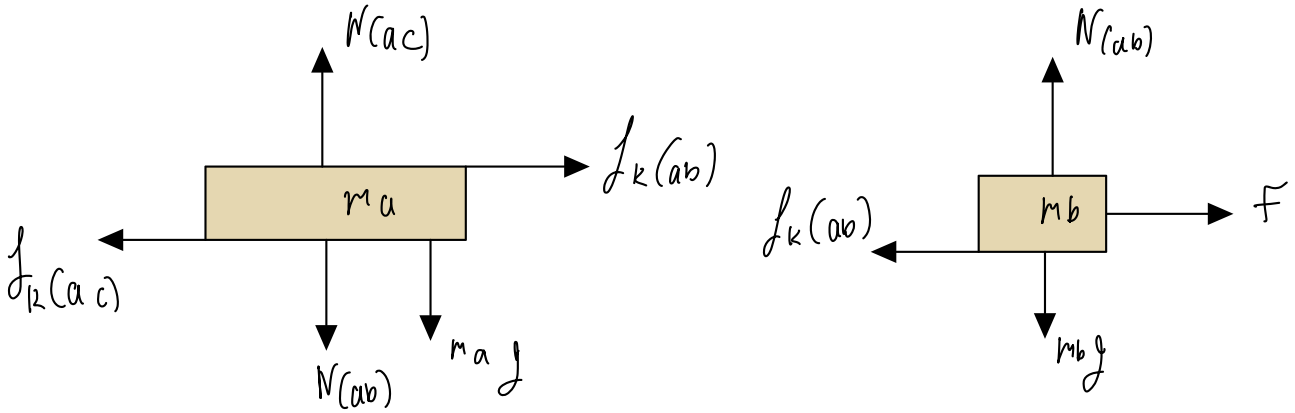
if $f_{s(ac)} < F < f_{s(ab)}$

0.6



if $F > f_{s(ab)}$ and $f_{s(ac)}$

0.7



0.8 if $f_s(ab) < f_s(ac) < F$