YAKEEN NEET 2.0

2026

Laws of Motion

PHYSICS

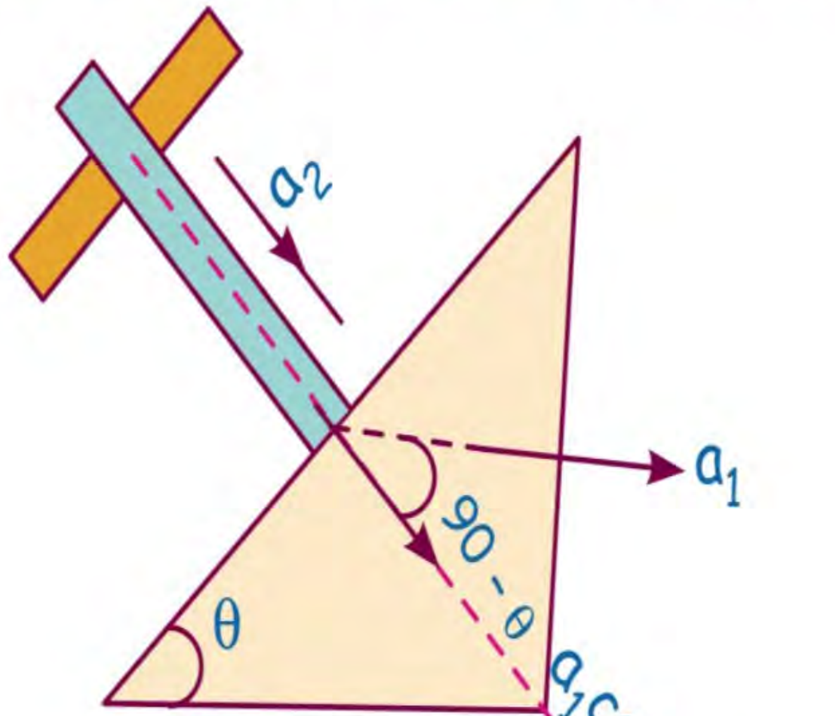
Lecture 17

By - Saleem Ahmed Sir

Topics to be covered

1. Wedge constraint and important questions NLM
2.
3.
4.

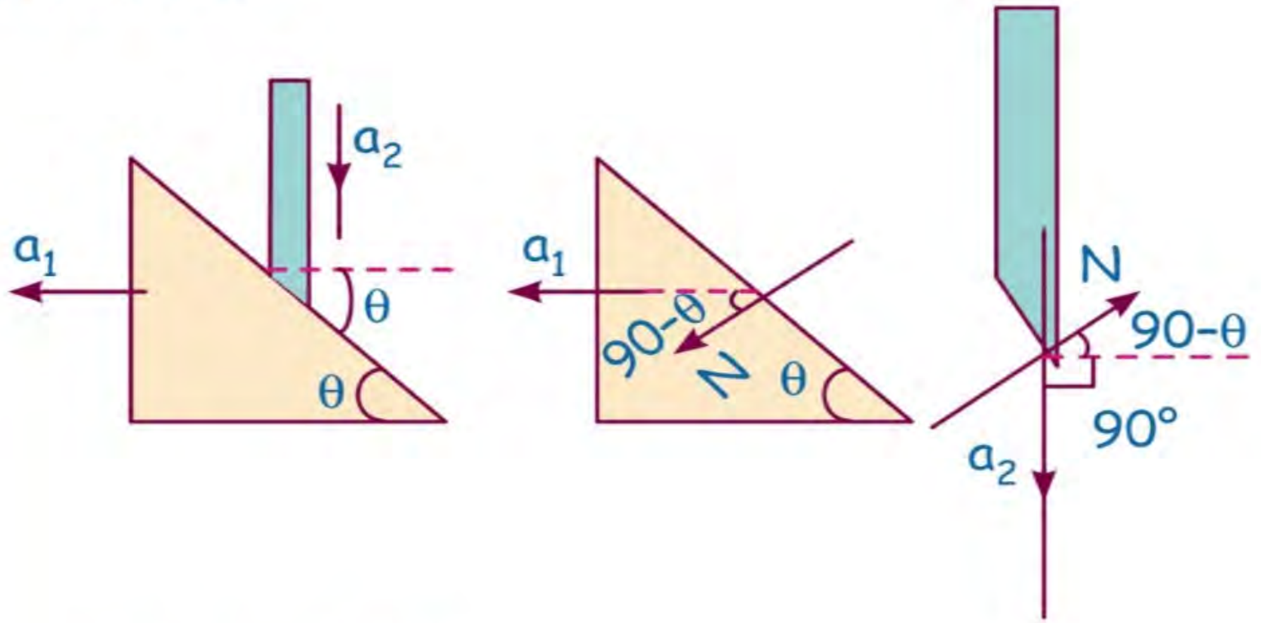
Q. Find constraint relation for following fig.



$$a_2 = a_1 \cos(90 - \theta)$$

$$\boxed{a_2 = a_1 \sin\theta}$$

Method-2:



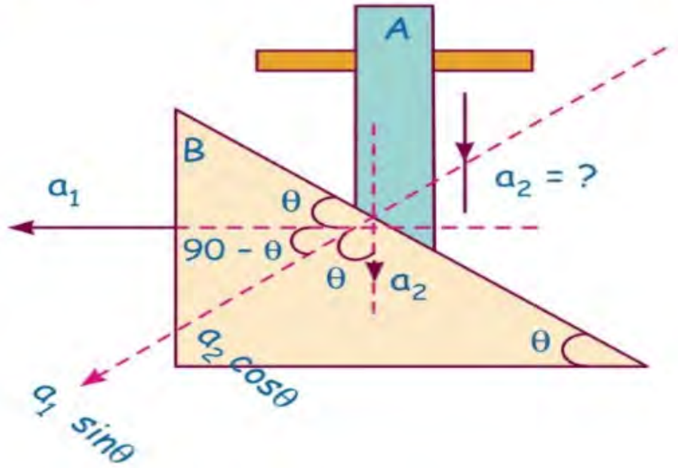
$$\vec{N_1}.\vec{a_1} + \vec{N_2}.\vec{a_2} = 0$$

$$Na_1 \cos(90 - \theta) + Na_2 \cos(90 + 90 - \theta) = 0$$

$$a_1 \sin\theta - a_2 \cos\theta = 0$$

$$\boxed{a_1 \sin\theta = a_2 \cos\theta}$$

WEDGE CONSTRAINT



Method-1:

- There no relative motion along common normal.
- Component of acc of A & B along the common normal same

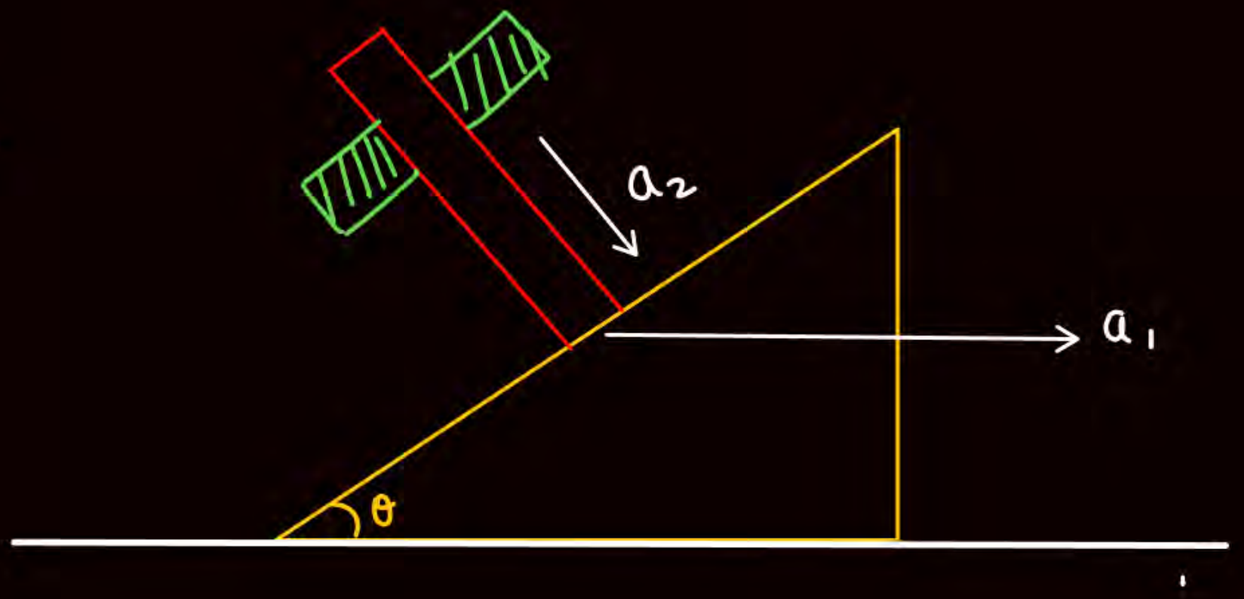
$$a_1 \sin\theta = a_2 \cos\theta$$

SKC

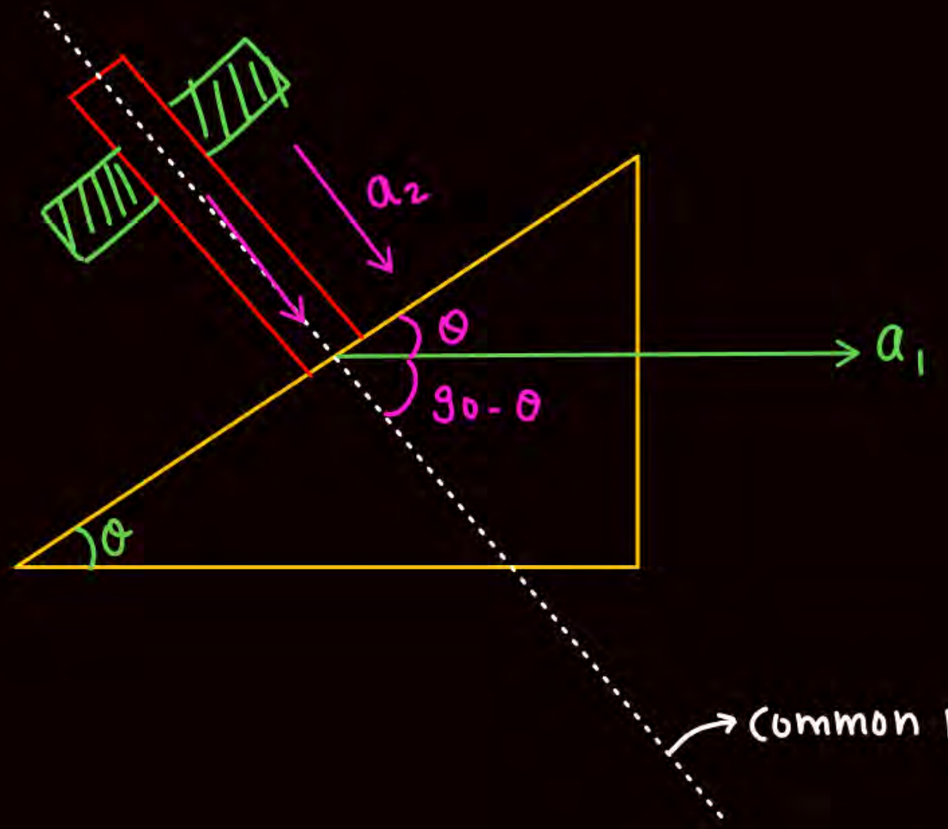
देख भाई सीधी बात no bakwas, दोनो बंदो का Acc normal की तरफ बराबर करदो।

wedge Constraint

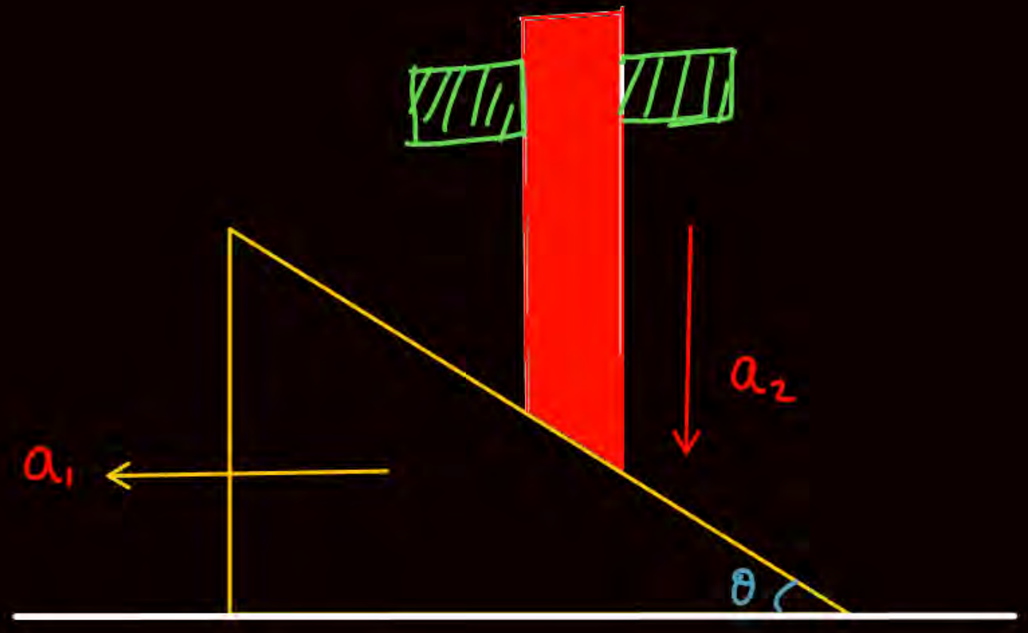
Q

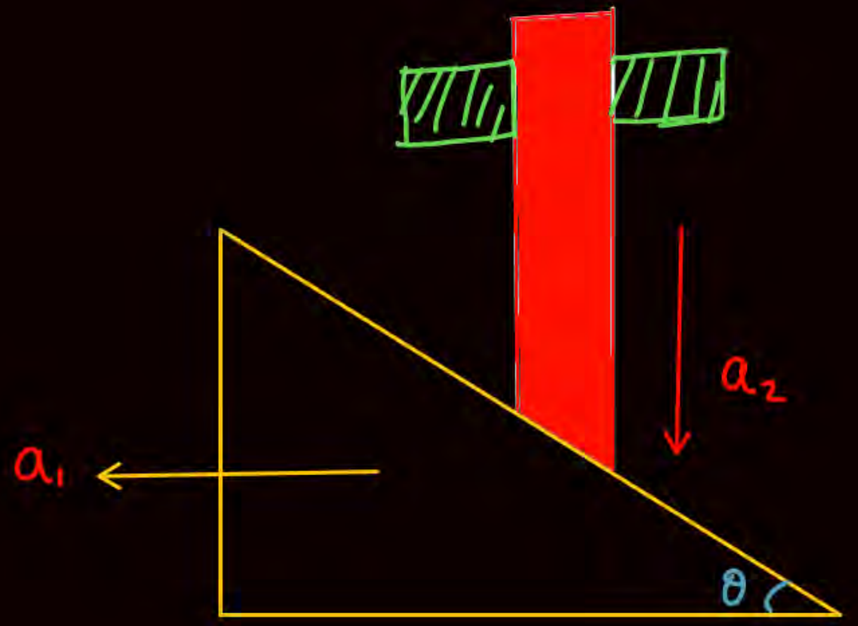


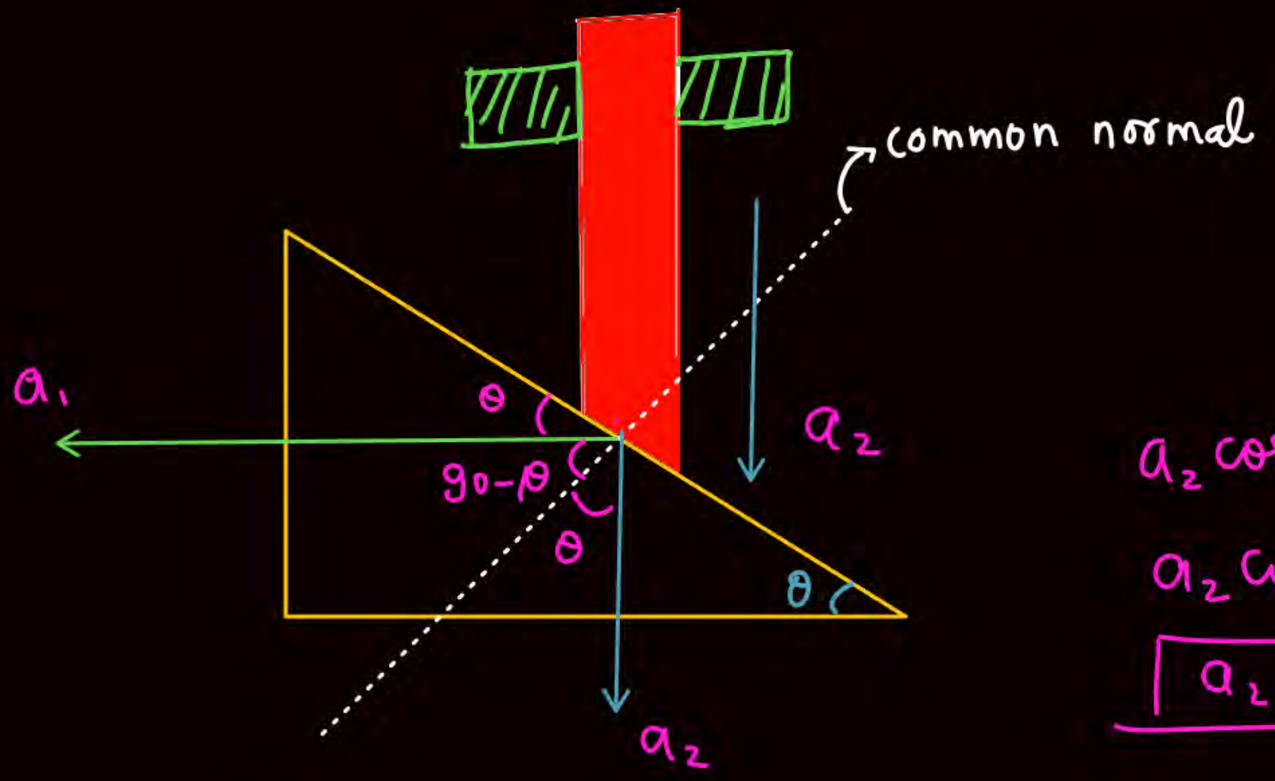
Q



$$a_1 \cos(90-\theta) = a_2$$


a_2
a_1
θ


a_2
a_1
θ



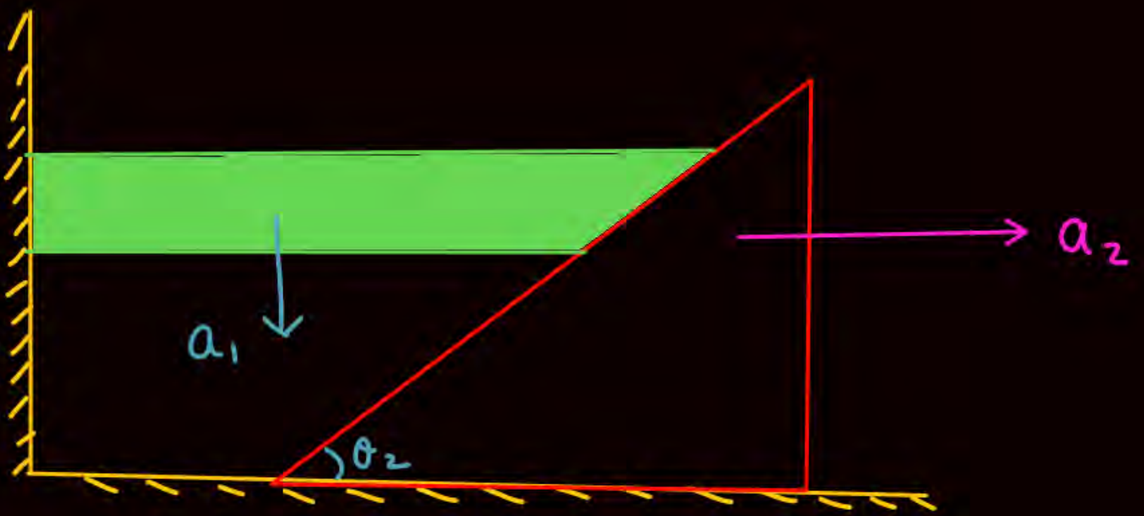
$$a_2 \cos\theta = a_1 \cos(90-\theta)$$

$$a_2 \cos\theta = a_1 \sin\theta$$

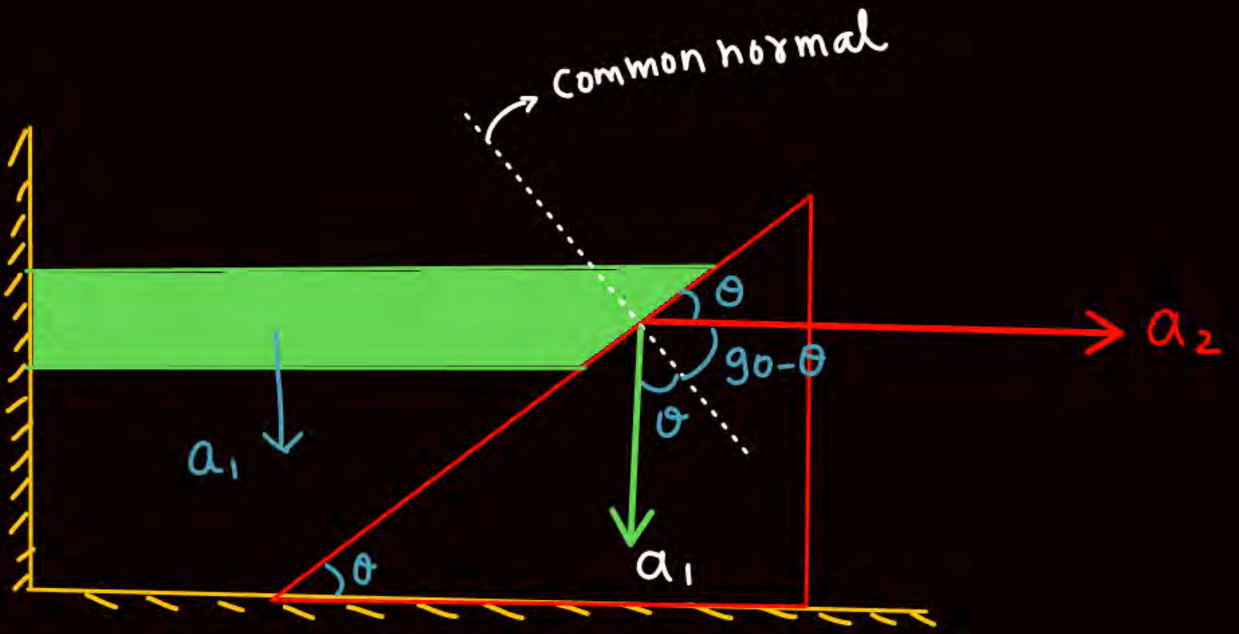
$$\boxed{a_2 = a_1 \tan\theta}$$

$$a_2 \cos\theta = a_1 \sin\theta$$

Q



Q



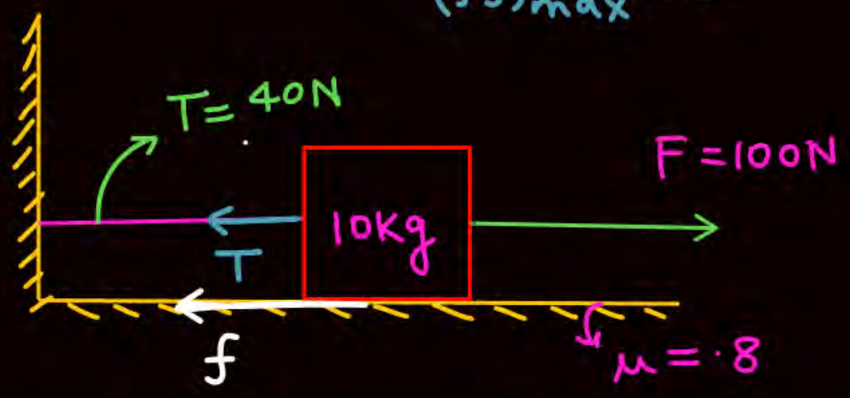
$$a_1 \cos\theta = a_2 \cos(90-\theta)$$

$$a_1 \cos\theta = a_2 \sin\theta$$

$$\boxed{a_1 = a_2 \tan\theta}$$

Q

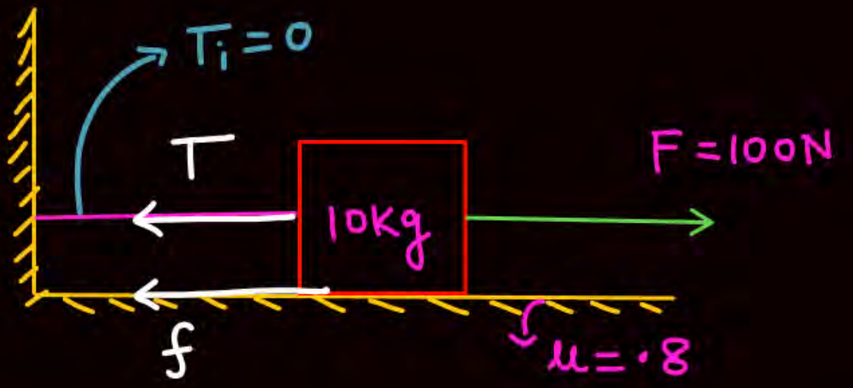
$(f_s)_{max} = 80$



$F = T + f$

$100 = 40 + f$

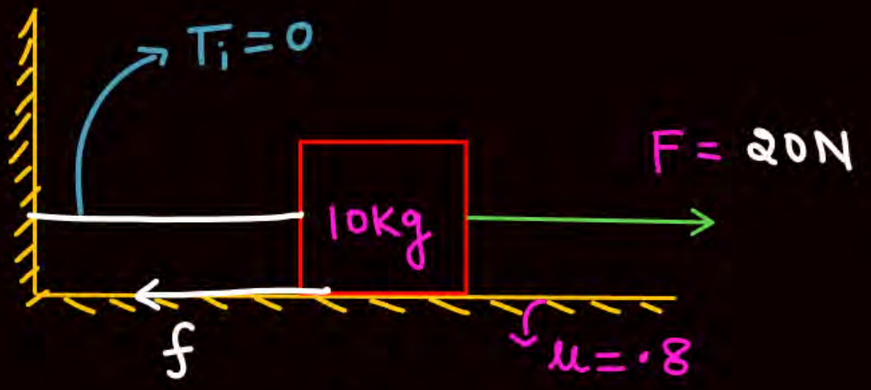
$\boxed{f = 60N}$



$f = 80 = (f_s)_{max}$ $\qquad f)_{max} = 80$

$T = 20N$

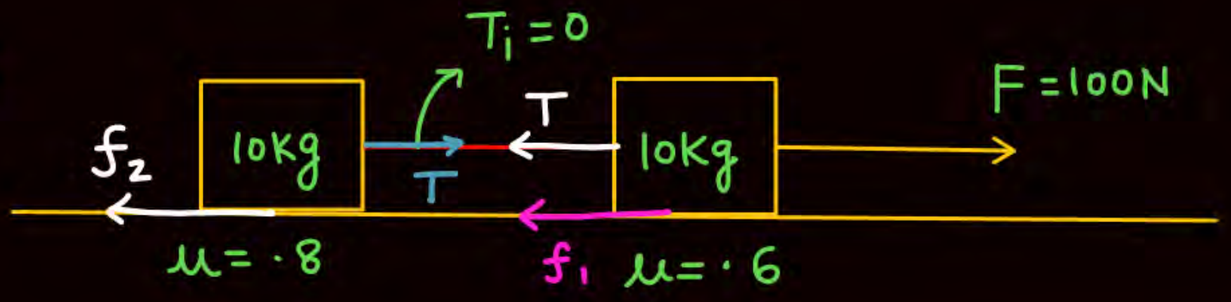
Q



$f = 20, T = 0$

$a = 0$

Q



$(f_s)_{max} = 80$ $\quad$ $(f_s)_{max} = 60$

both move

$F > 60 + 80$

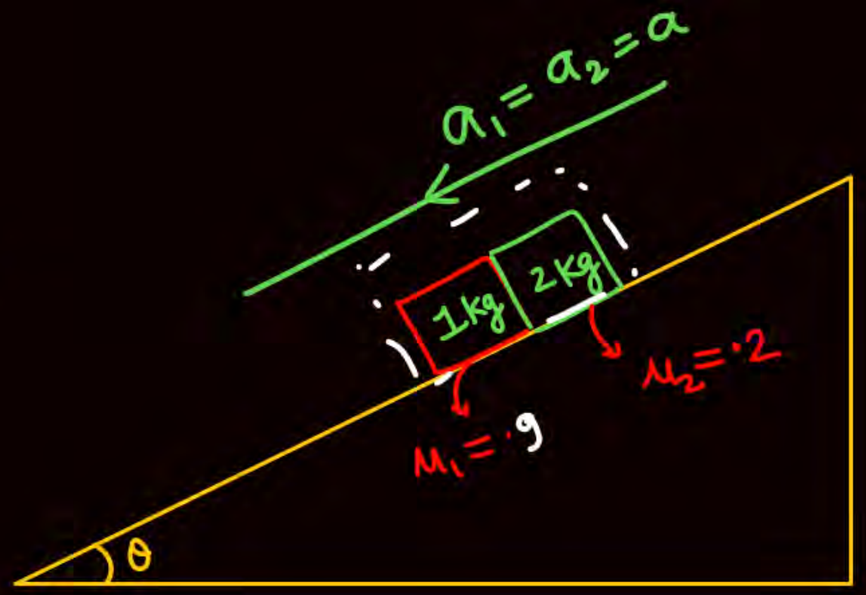
$F > 140$

$f_1 = 60$

$T = 40$

$T = f_2 = 40$

Q



SKC

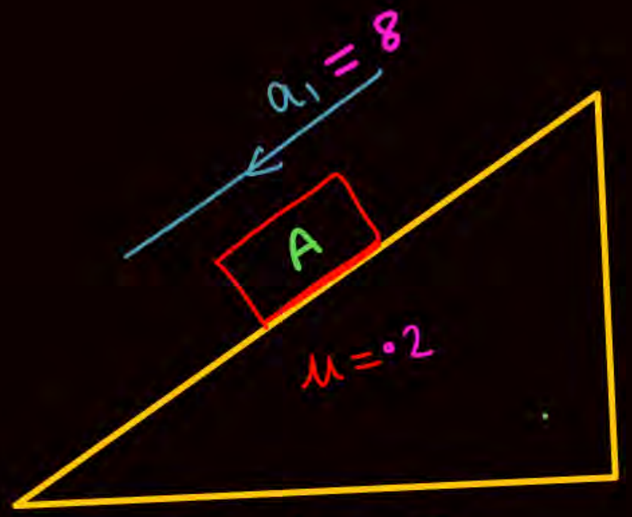
Agar aage wale ka μ jyada hai to sath-sath chalenge with same acc

$$a_1 = a_2 = \frac{(m_1+m_2)g\sin\theta - f_1 - f_2}{m_1+m_2} \quad (R)$$

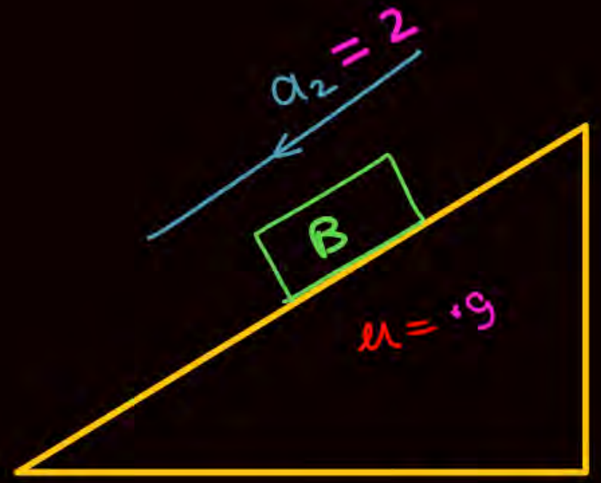
$$f_1 = \mu_1 m_1 g\cos\theta$$
$$f_2 = \mu_2 m_2 g\cos\theta$$

SKC

Peeche wale ka μ jyada hai to vo dheere hone ki wajah se peeche Rah jayega $N = 0$

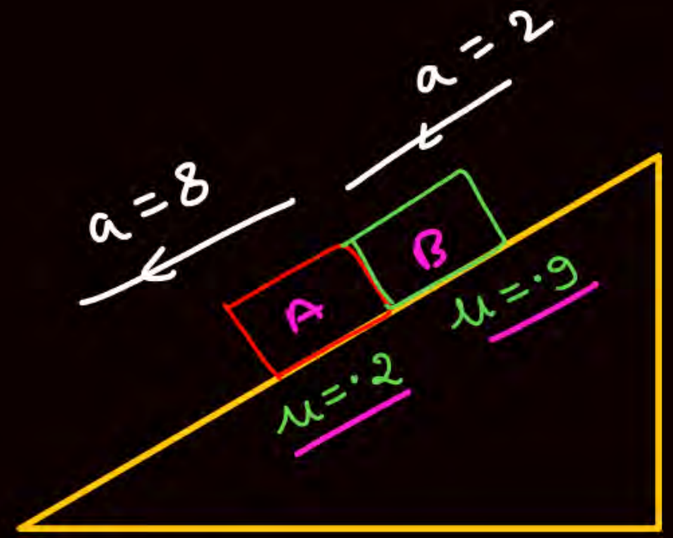


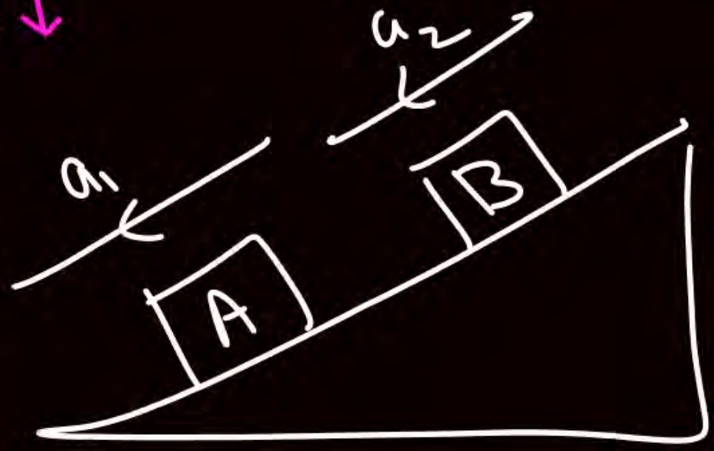
$\mu \downarrow a \uparrow$



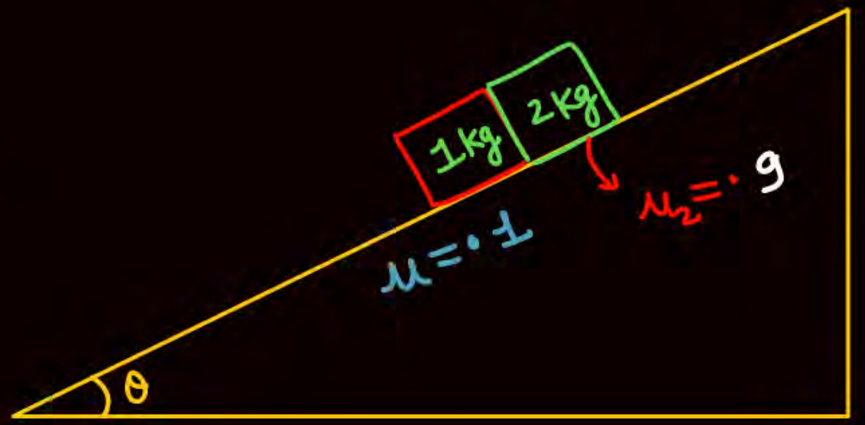
$\mu \uparrow, f \uparrow, a \downarrow$

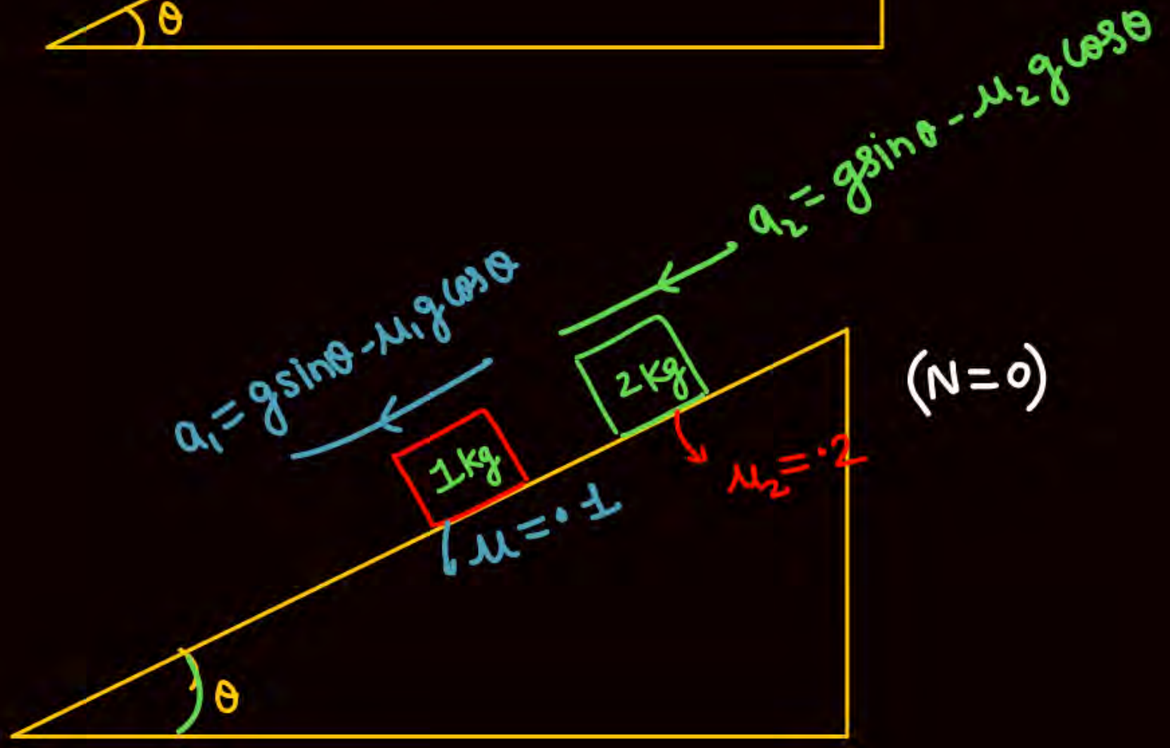
$\equiv$





Q





(N=0)

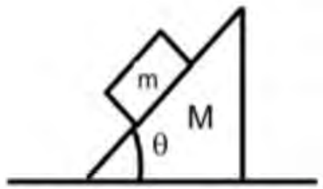
SKC

Agar aage wale ka
μ jyada hai to
Sath-Sath chalenge
with same acc

SKC

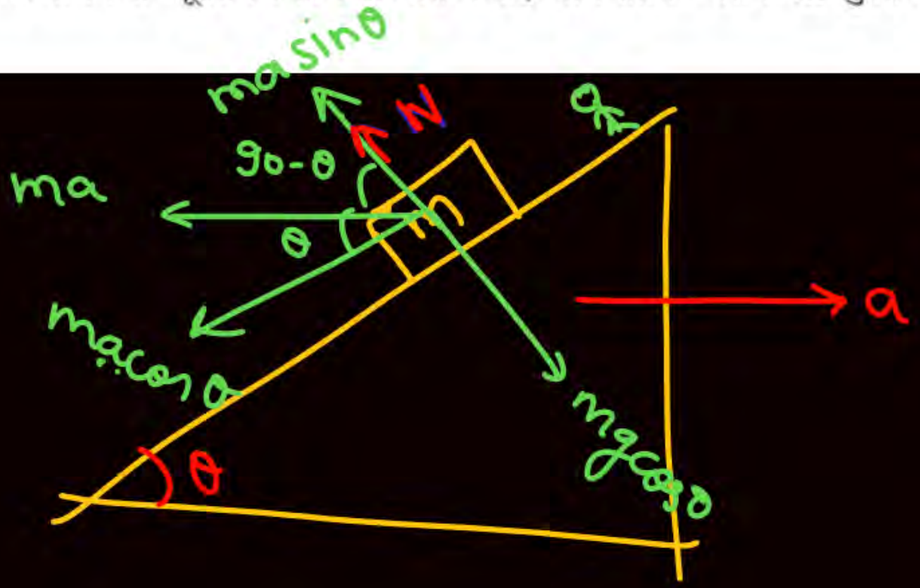
Peeche wale ka
μ jyada hai to vo dheere
hone ki wajah se peeche
Rah jayega

14. A block of mass m lies on wedge of mass M as shown in figure.
द्रव्यमान m का एक ब्लॉक चित्रानुसार M द्रव्यमान के वेज पर रखा हुआ है।



With what minimum acceleration must the wedge be moved towards right horizontally so that block m falls freely.
वेज को दांयी ओर क्षैतिज रूप से किस न्यूनतम त्वरण से गति कराई जाये ताकि ब्लॉक m मुक्त रूप से गिर सके?

Ans. $a = g \cot \theta$

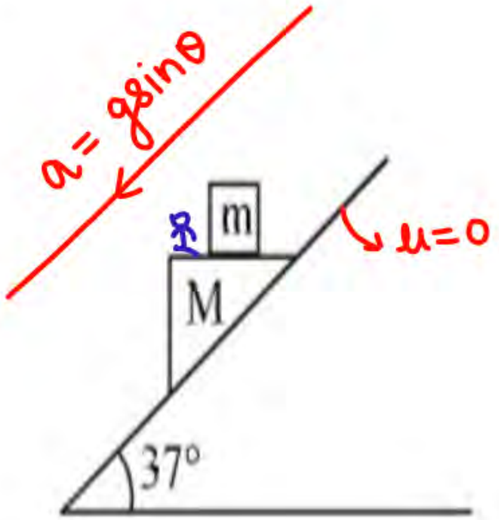


$ma\sin\theta = mg\cos\theta$

$a = g\cot\theta$

24. Block M slides down on frictionless incline as shown. Find the minimum friction coefficient so that m does not slide with respect to M.

चित्रानुसार ब्लॉक M एक घर्षणरहित नत तल पर नीचे की ओर फिसलता है। वह न्यूनतम घर्षण गुणांक ज्ञात कीजिये ताकि m, M के सापेक्ष इस पर गति ना करे?



Ans. 3/4

does not slide with respect to M.

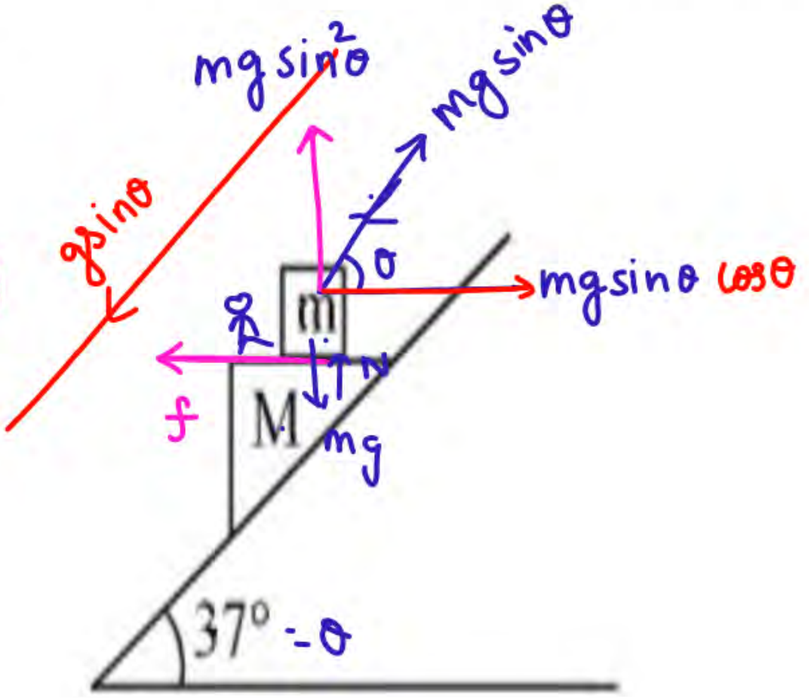
चित्रानुसार ब्लॉक M एक घर्षणरहित नत तल पर नीचे की ओर फिसलता है। वह न्यूनतम घर्षण गुणांक ज्ञात

m, M के सापेक्ष इस पर गति ना करे?

$mg\sin\theta.\cos\theta = (f_s)_{max}$

$mg\sin\theta\cos\theta = \mu(mg - mg\sin^2\theta)$

Solve & get



Ans. 3/4

THANK YOU