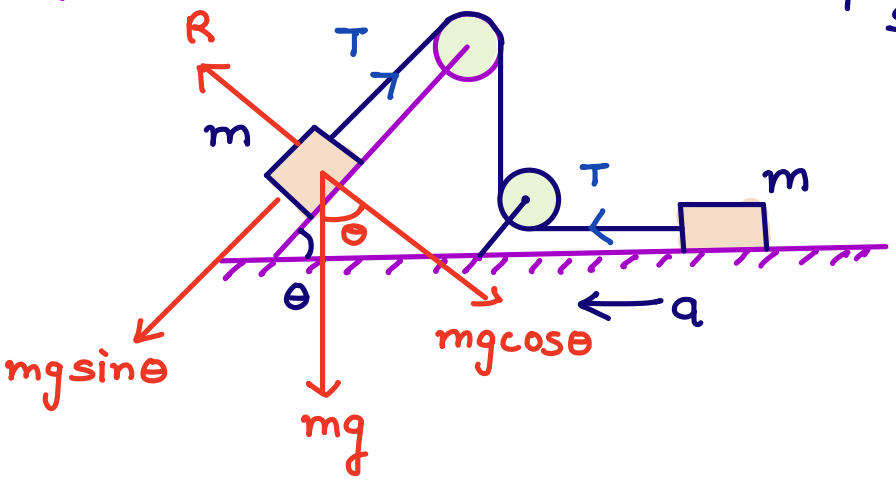
Q.

find Tension in String.

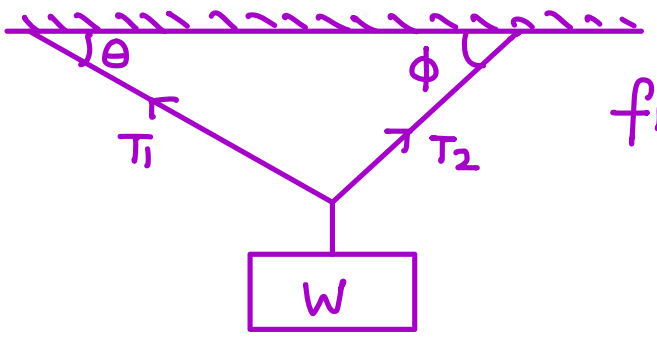


$$mg\sin\theta - T = ma \quad — (1)$$

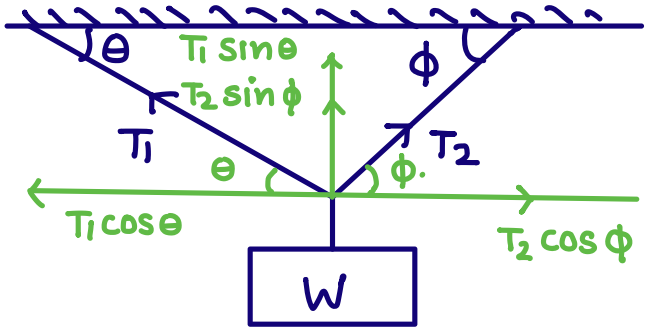
$$T = ma \quad — (2)$$

$$a = \frac{g\sin\theta}{2} \qquad T = \frac{mg\sin\theta}{2}$$

Q



find value of T_1 & T_2 in terms of W, θ, ϕ.



$$T_1 \sin\theta + T_2 \sin\phi = W \quad -(1)$$

$$T_1 \cos\theta = T_2 \cos\phi \quad -(2)$$

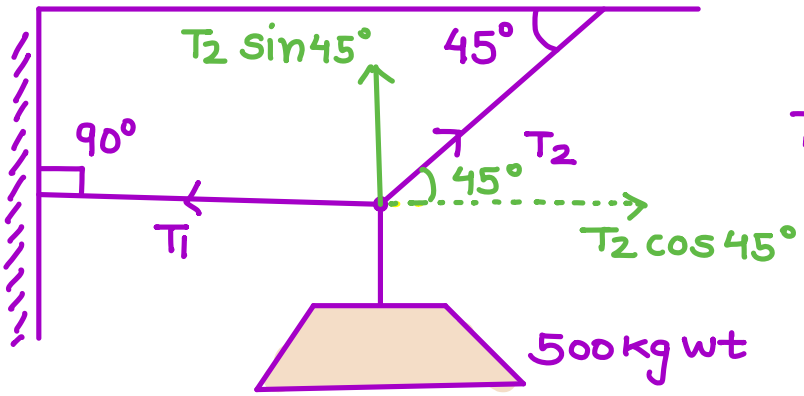
$$T_2 = T_1 \frac{\cos\theta}{\cos\phi} \quad \{\text{put in } (1)\}$$

$$T_1 \sin\theta + T_1 \frac{\sin\phi}{\cos\phi} \cos\theta = W$$

$$T_1 \left[\cos\phi \sin\theta + \sin\phi \cos\theta\right] = W \cos\phi$$

$$T_1 = \frac{W \cos\phi}{\sin(\theta+\phi)} \qquad \text{Ily, } T_2 = \frac{W \cos\theta}{\sin(\theta+\phi)}$$

Q.



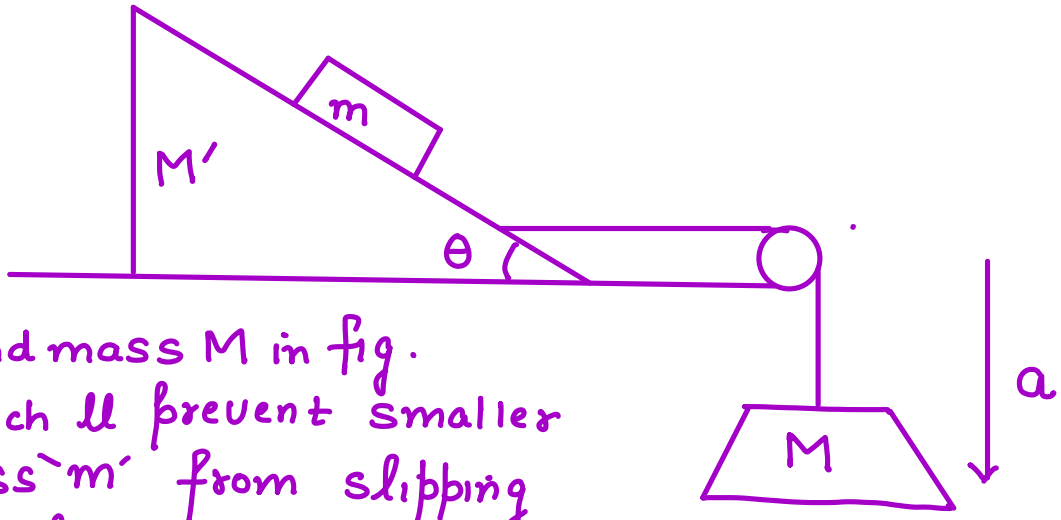
find Tension T_1 & T_2.

$T_2 \sin 45° = W$ — ①

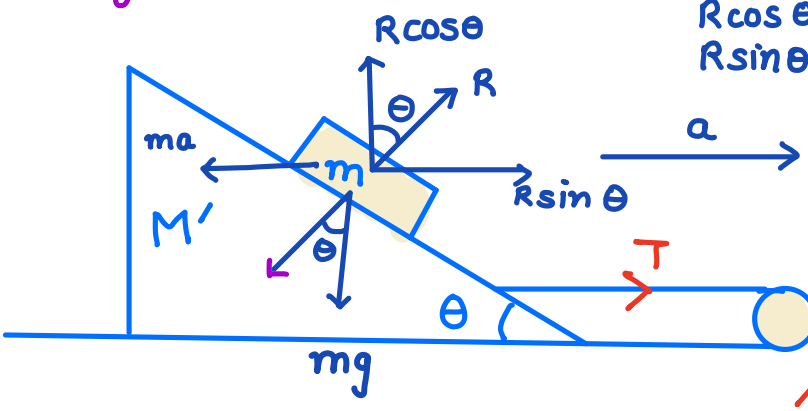
$T_2 \cos 45° = T_1$ — ②

$T_1 = 5000\,N$, $T_2 = 5000\sqrt{2}\,N$

Q.

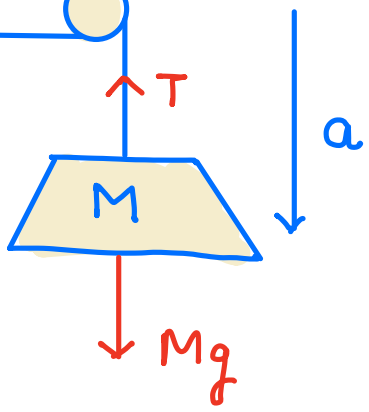


find mass M in fig. which ll prevent smaller mass `m' from slipping over triangular block



$R\cos\theta = mg$

$R\sin\theta = ma$



$Mg - T = Ma$ — ①

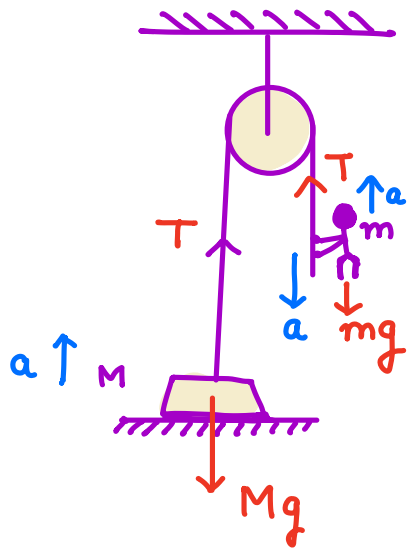
$T = (M' + m)\,a$ — ②

$M = \dfrac{(M' + m)\,a}{(g - a)}$ — ③

$$mg = R\cos\theta \quad ma = R\sin\theta \quad \Rightarrow \quad g/a = \frac{\cos\theta}{\sin\theta} = \cot\theta$$

$$M = \frac{M'+m}{(g/a-1)} = \frac{M'+m}{(\cot\theta-1)}$$

Q.



$a > \left(\frac{M}{m}-1\right)g$ → To prove :

aim : to lift M'

$T > Mg \quad -①$

$T - mg = ma$

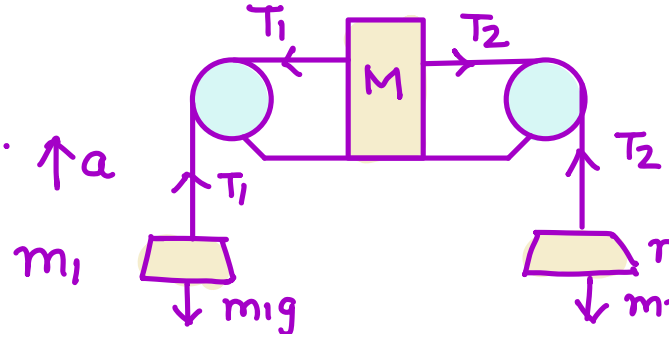
$T = mg + ma \quad -②$

$mg + ma > Mg$

$ma > (M-m)g$

$\Rightarrow a > \left(\frac{M}{m}-1\right)g.$

Q.



find Tension & acceleration