

YAKEEN NEET 2.0

2026

Laws of Motion

PHYSICS

Lecture 05

By – Saleem Ahmed Sir

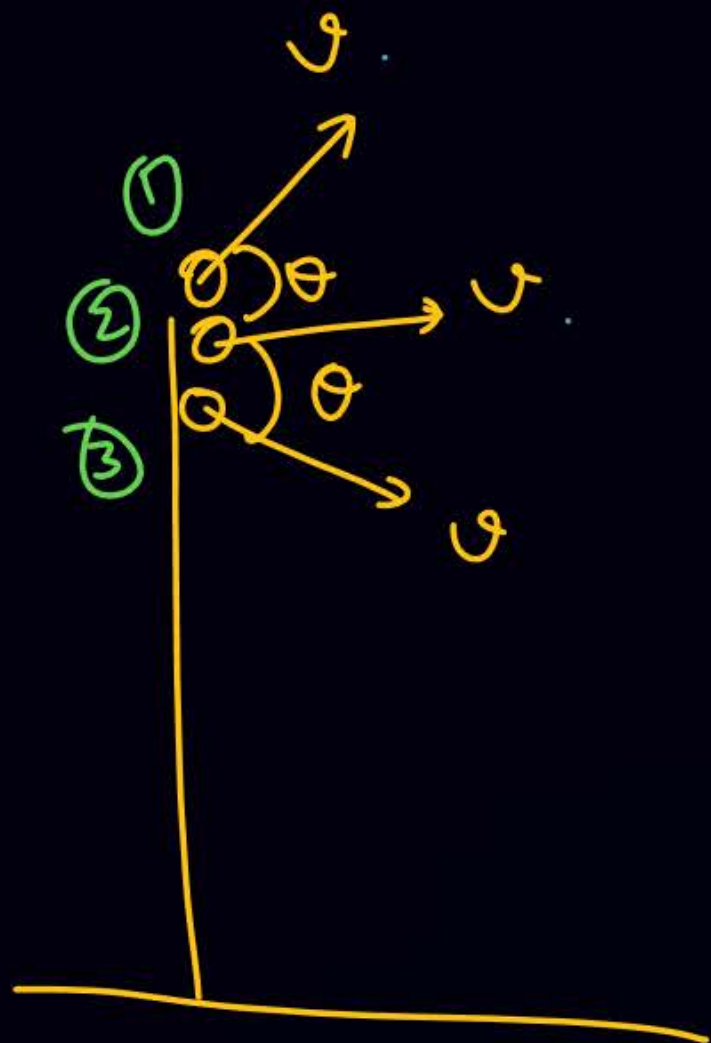




Today's Goal

— NLM question

35 ques east → 35 min
 5 ques tough-moel → 10 min
45 min
 5 ques tough
 15 mint
 —



① if sep. b/w ① & ② is changing at const rate u

$$|\vec{v}_1 - \vec{v}_2| = u$$

$$2u \sin\left(\frac{\theta}{2}\right) = u$$

$$\theta = 60^\circ$$

② find rate of change of sepⁿ b/w ① & ③

$$|\vec{v}_1 - \vec{v}_3| = 2u \sin\left(\frac{120}{2}\right) = u\sqrt{3}$$

Q

find distance b/w particle at $t = 2.5 \text{ sec}$.

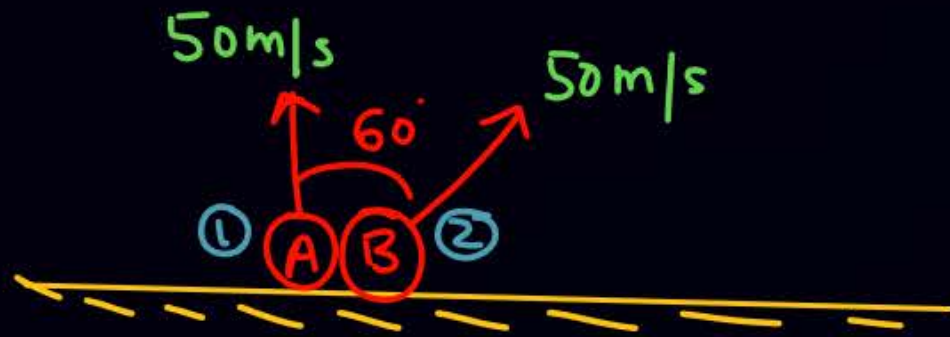
Sol

$$|\vec{u}_2 - \vec{u}_1| \times t$$

$$= 2u \sin \frac{\theta}{2} \times t = 2 \times 50 \sin 30^\circ \times 2.5$$

$$= 100 \times \frac{1}{2} \times 2.5$$

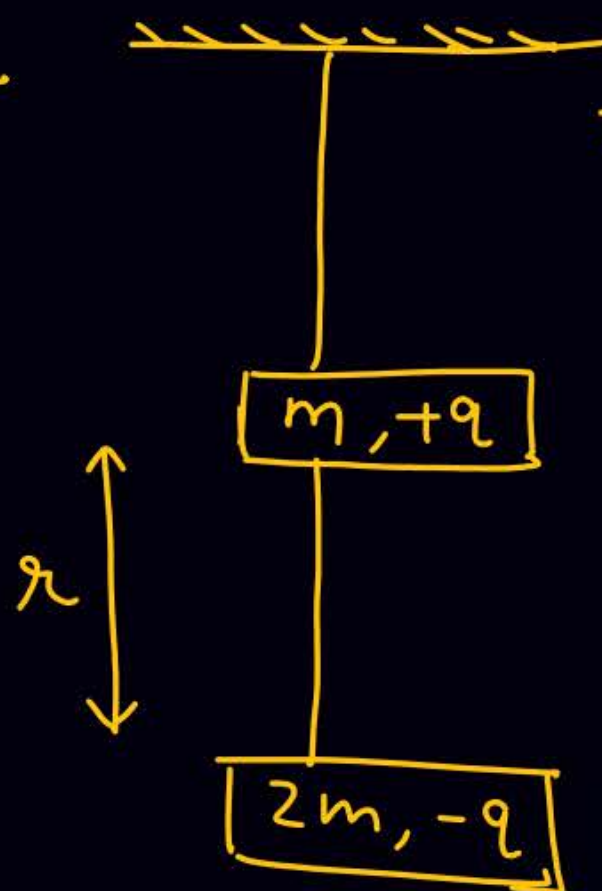
$$= \underline{\underline{125}}$$



majority
125
 $50\sqrt{3}$



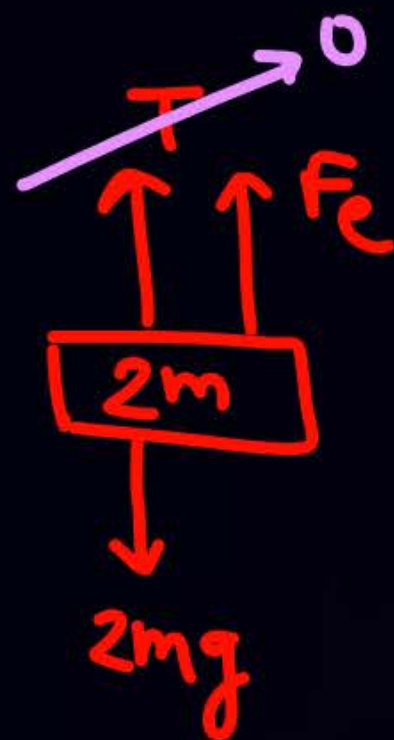
Q



find the min. value of $-q$ so that string become zero.

Tension in lower

Solⁿ



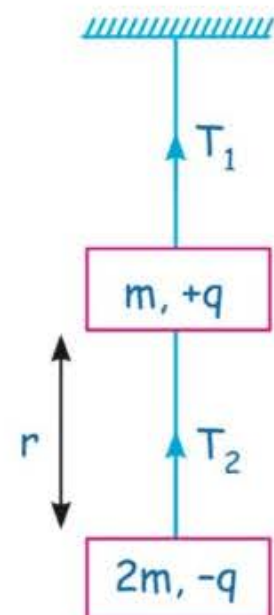
$$F_e = 2mg$$

$$\frac{kqq}{r^2} = 2mg$$

$$q = \sqrt{}$$



Q. Find the value of q so that tension in lower string becomes zero



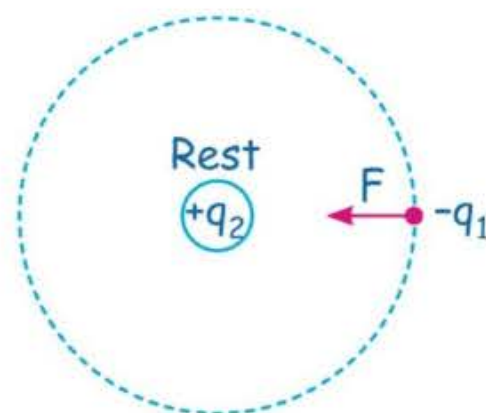
Sol.

$$T_2 = 0$$

$$F_e = \frac{kq_1q_2}{r^2}$$

$$\frac{kq^2}{r^2} = 2mg$$

Q. A charge $(-q_1, m)$ is moving in a circular path of radius r around positive charge $+q_2$ with constant speed. Find speed

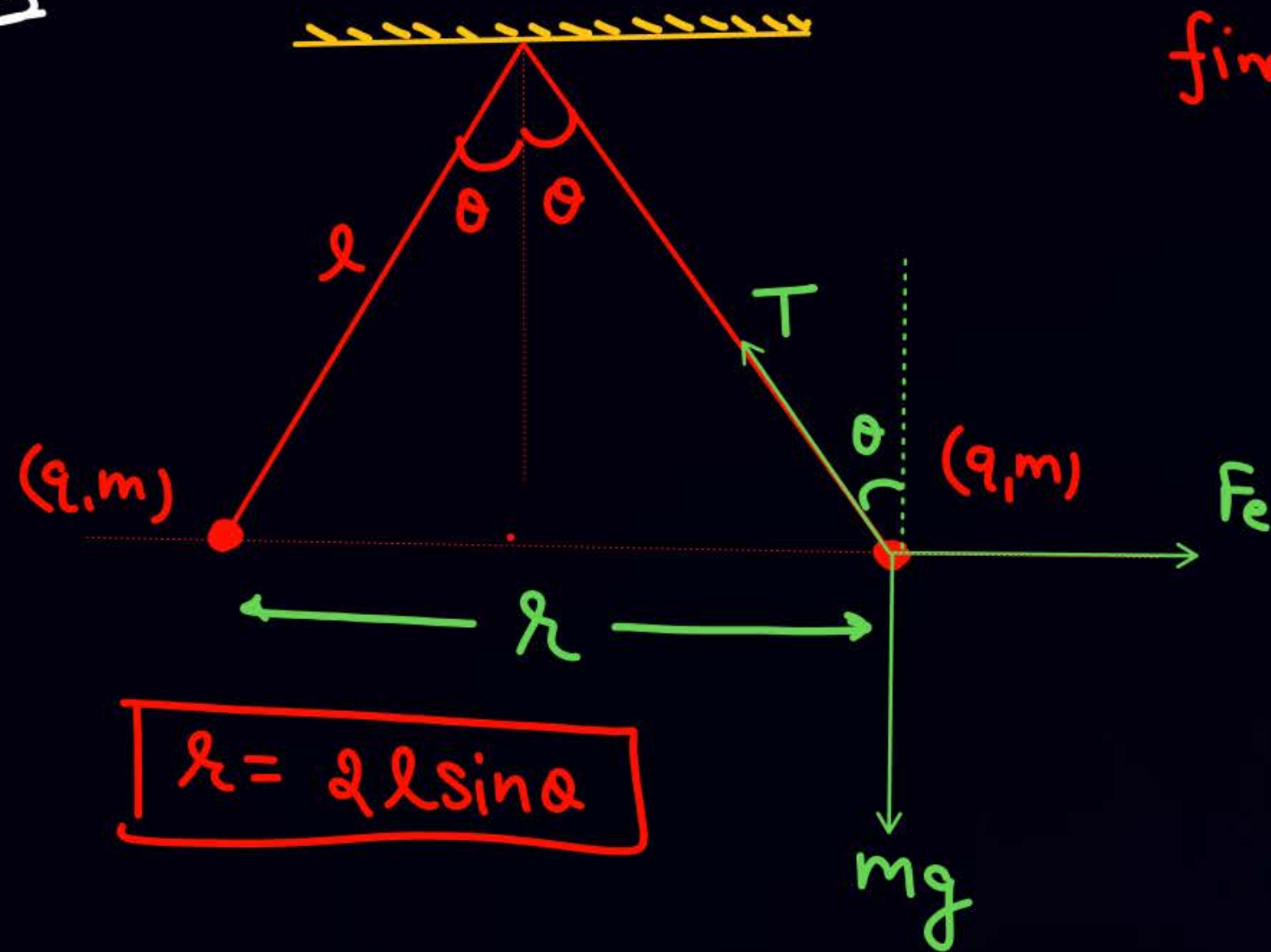


ऐसा तो Bohr's Model के first postulate में भी होता था।



Q

Both masses are in equilibrium
find θ



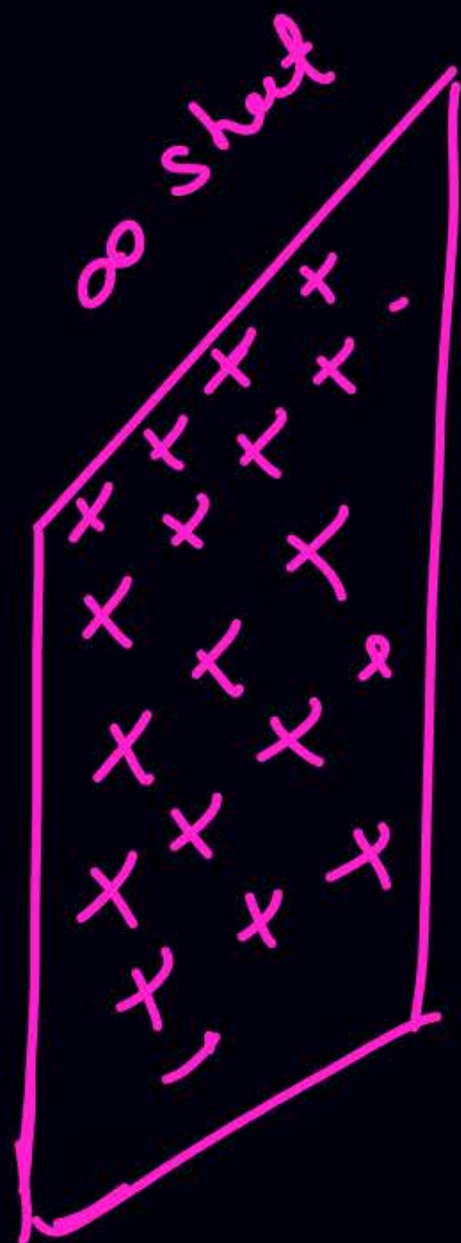
$$T \sin \theta = F_e$$

$$T \cos \theta = mg$$

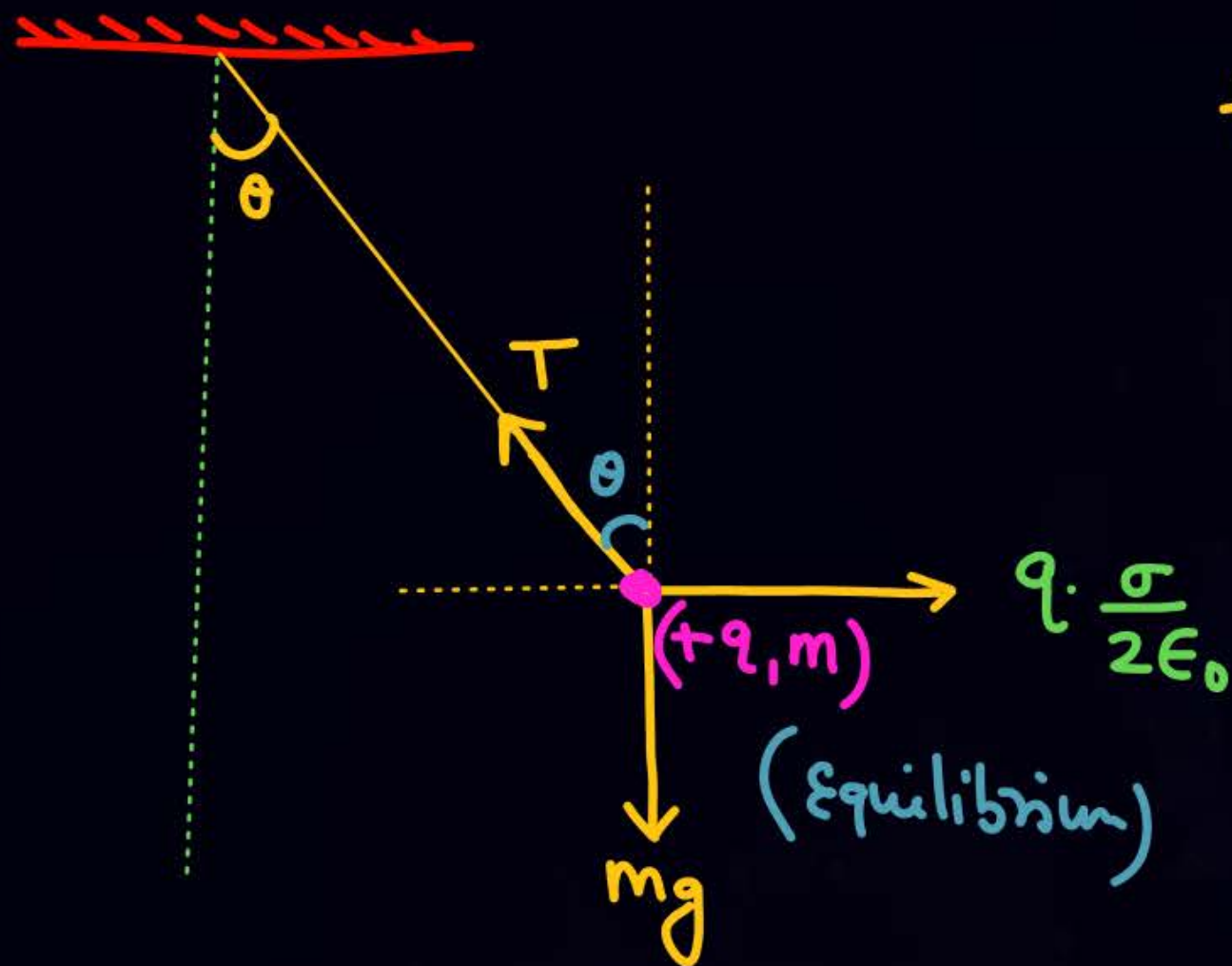
$$\tan \theta = \frac{F_e}{mg}$$

$$F_e = \frac{kq^2}{r^2} = \frac{kq^2}{(2l \sin \theta)^2}$$

Q

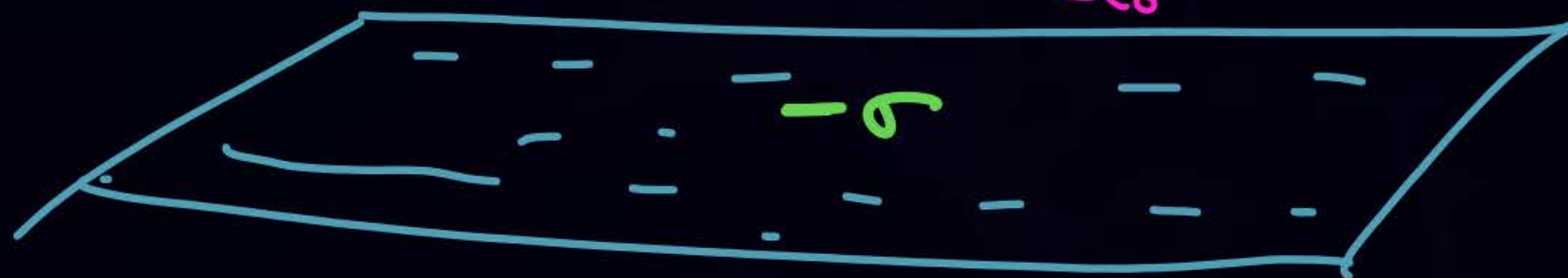
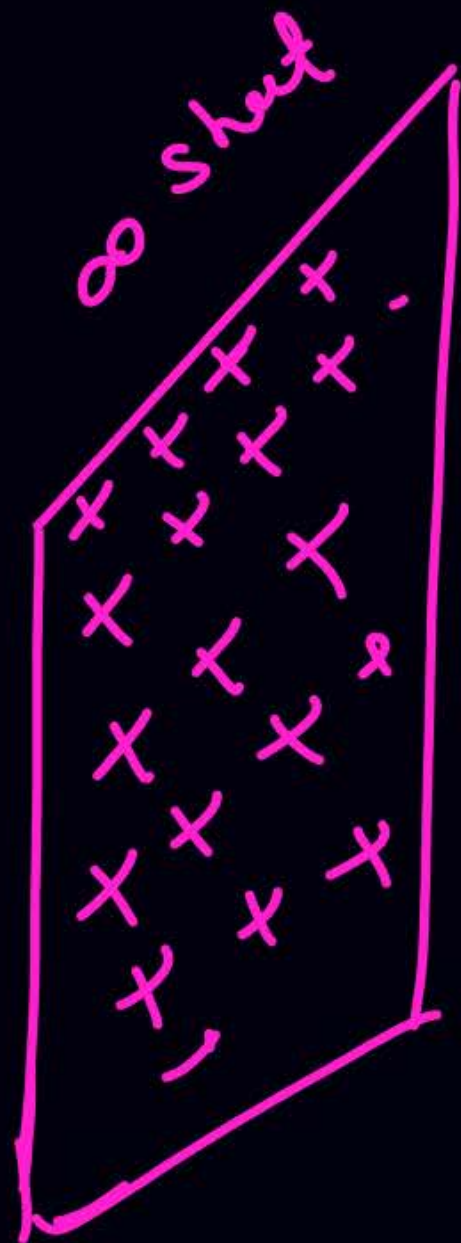


$$F = qE$$



$$\tan \theta = \frac{F}{mg} = \frac{q \sigma / 2\epsilon_0}{mg}$$

σ



θ

T

$(+q, m)$

$mg + q \frac{\sigma}{2\epsilon_0}$

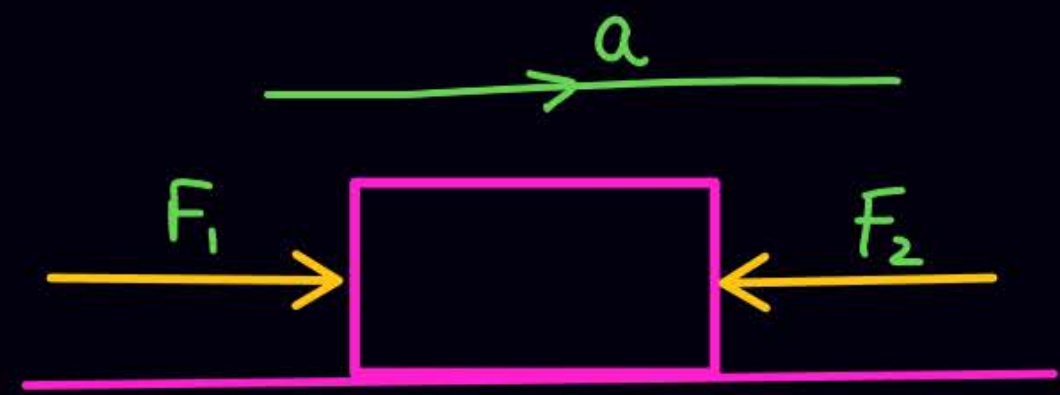
$q \cdot \frac{\sigma}{2\epsilon_0}$

(Equilibrium)

$$\tan \theta = \frac{F}{mg} = \frac{q \sigma / 2\epsilon_0}{mg}$$



$F=ma$ (Waleques)

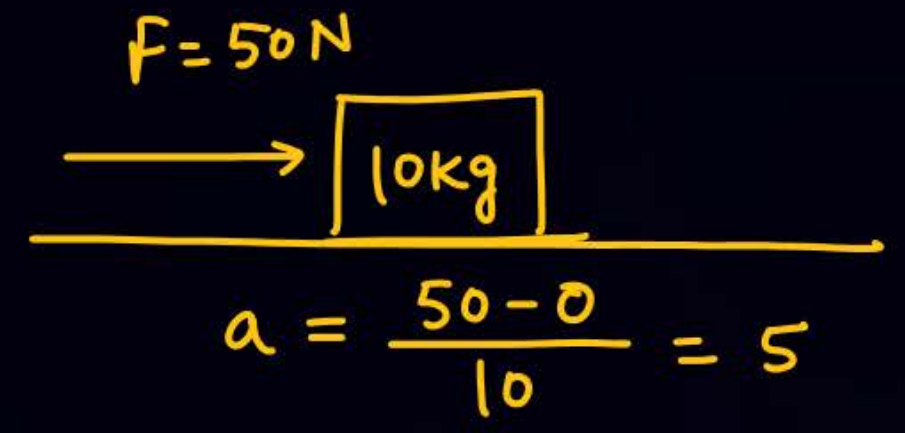


$$\vec{F}_{net} = m\vec{a}$$

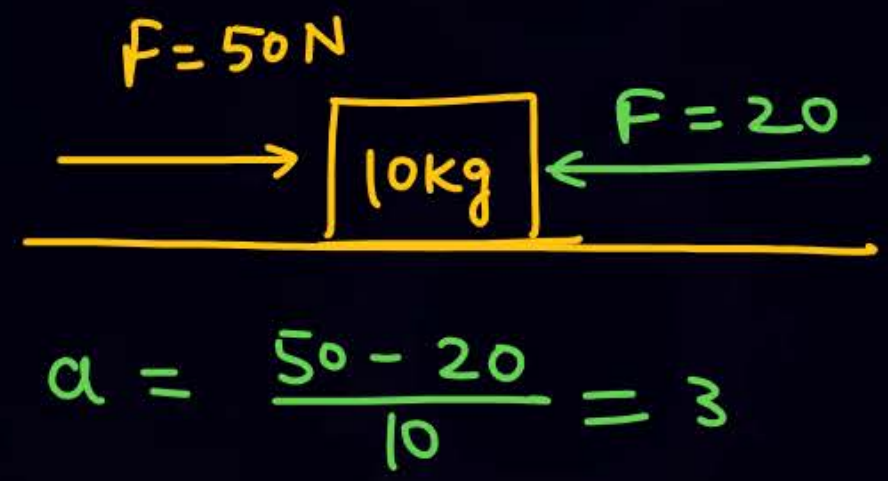
$$F_1 - F_2 = ma$$

$$a = \frac{F_1 - F_2}{m}$$

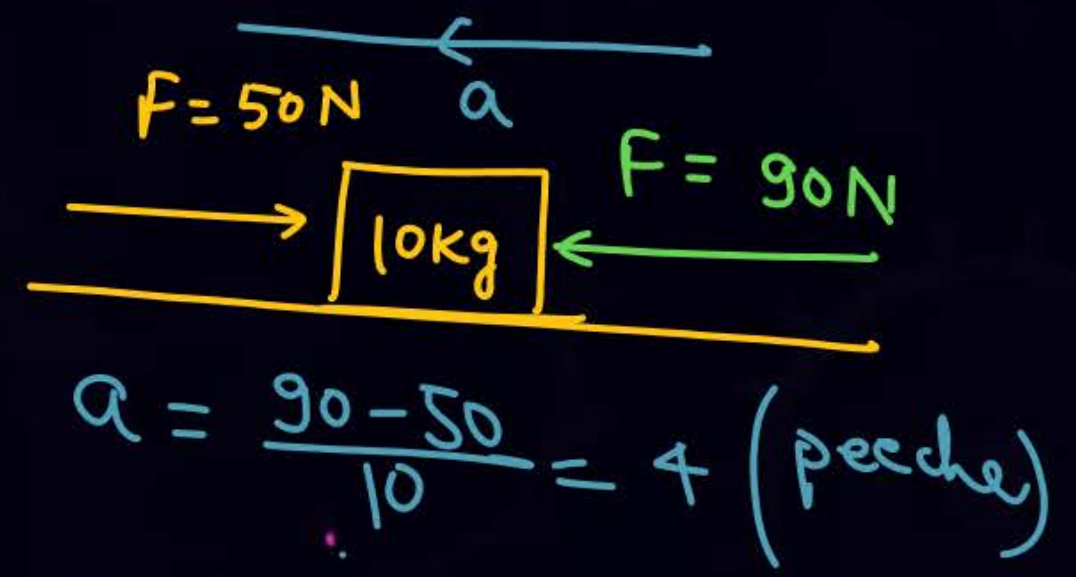
①

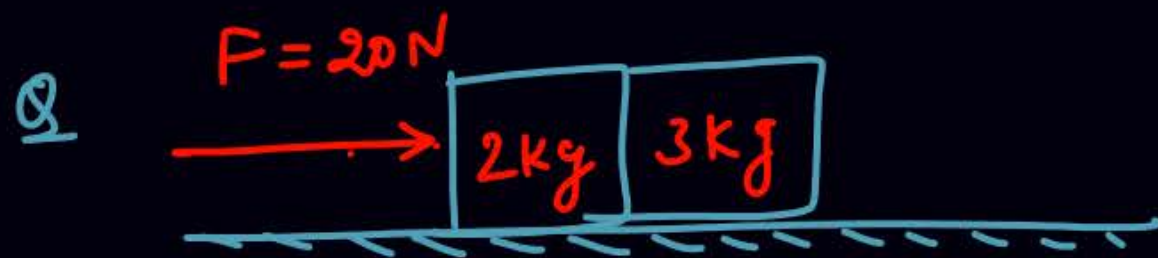


②

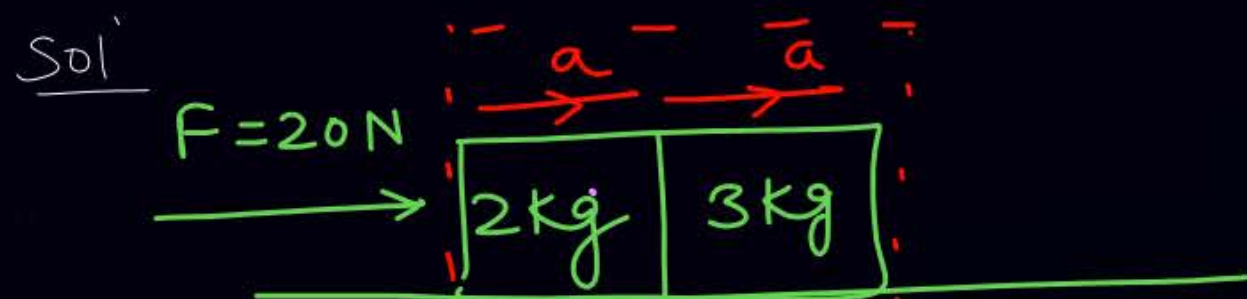


③





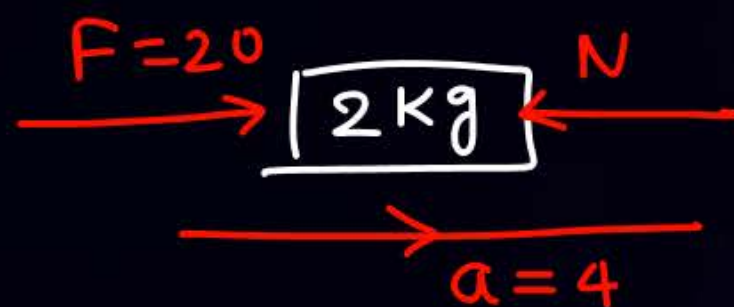
find acc of each block & normal force b/w them.



$$\vec{F}_{\text{net}} = m_{\text{total}} \vec{a}$$

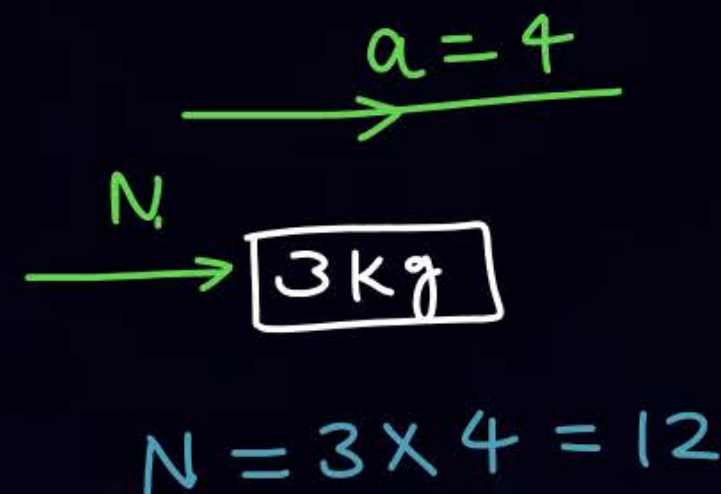
$$20 = 5a$$

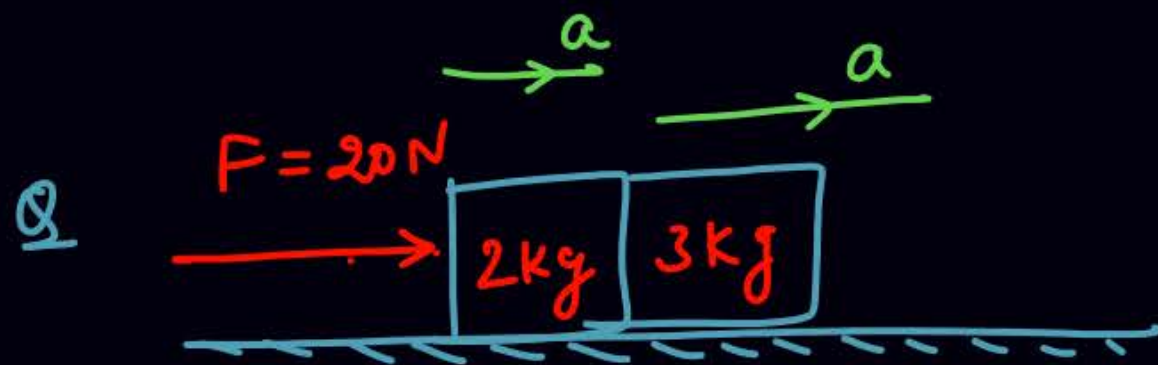
$$\boxed{a = 4}$$



$$20 - N = 2 \times 4$$

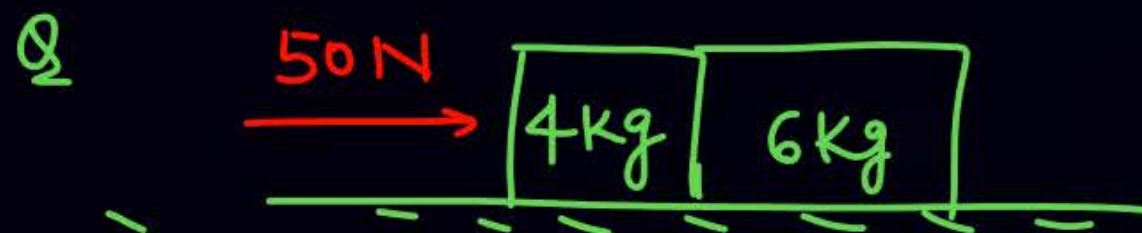
$$\boxed{N = 12}$$





$$a = \frac{20}{5} = 4$$

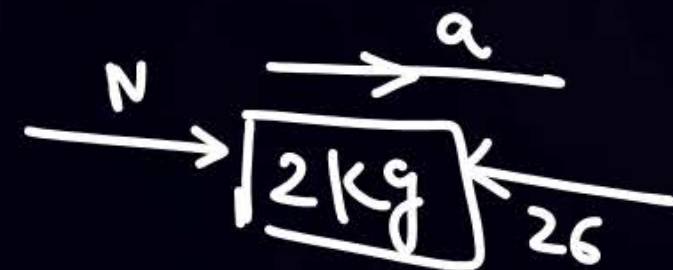
$$N = 3 \times 4 = 12$$



$$a = 5, \quad N = 30$$

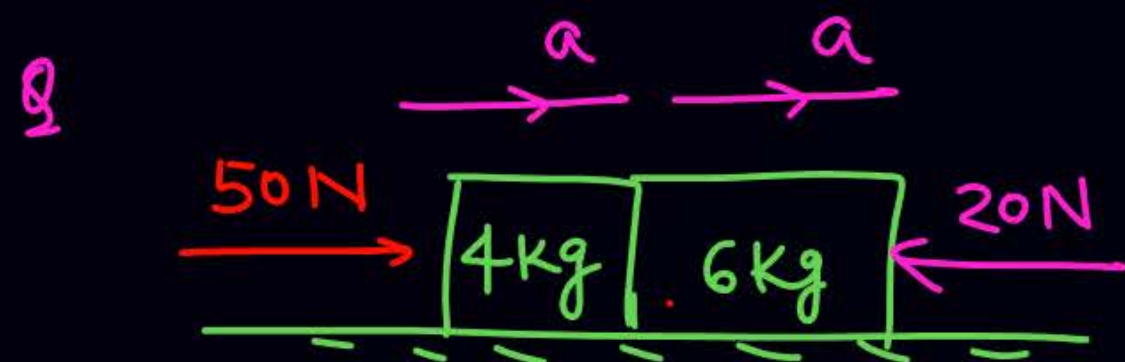


$$a = \frac{50 - 26}{8} = 3$$

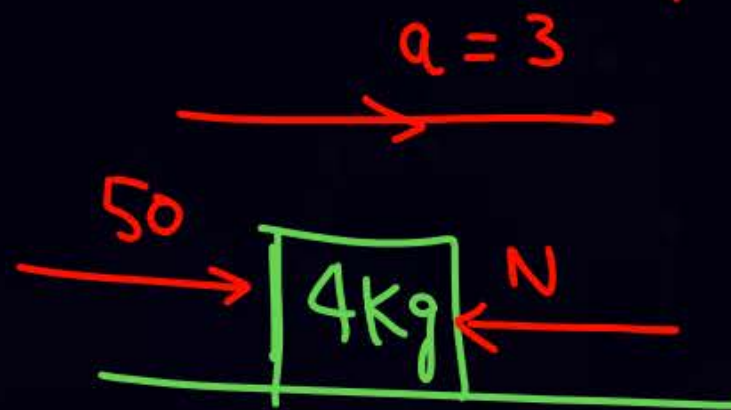


$$N - 26 = 2 \times 3$$

$$\boxed{N = 32}$$



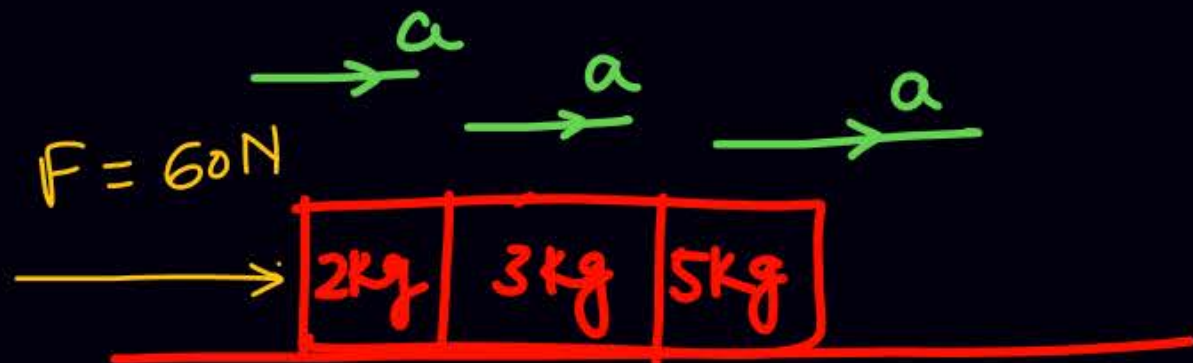
$$a = \frac{50 - 20}{10} = 3$$



$$50 - N = 4 \times 3$$

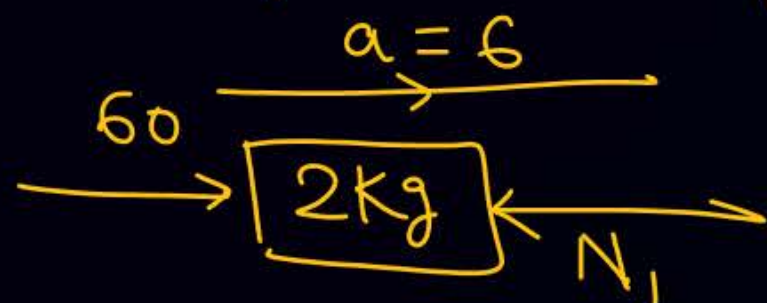
$$\boxed{N = 38}$$

Q



$$\textcircled{1} \quad a = \frac{60}{10} = 6$$

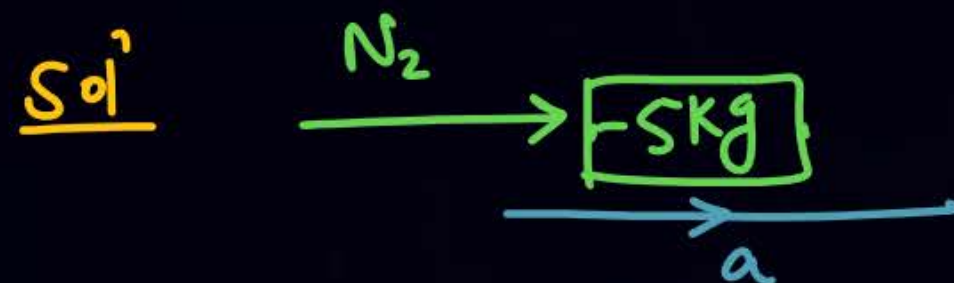
$\textcircled{2}$ Normal force b/w 2kg & 3kg



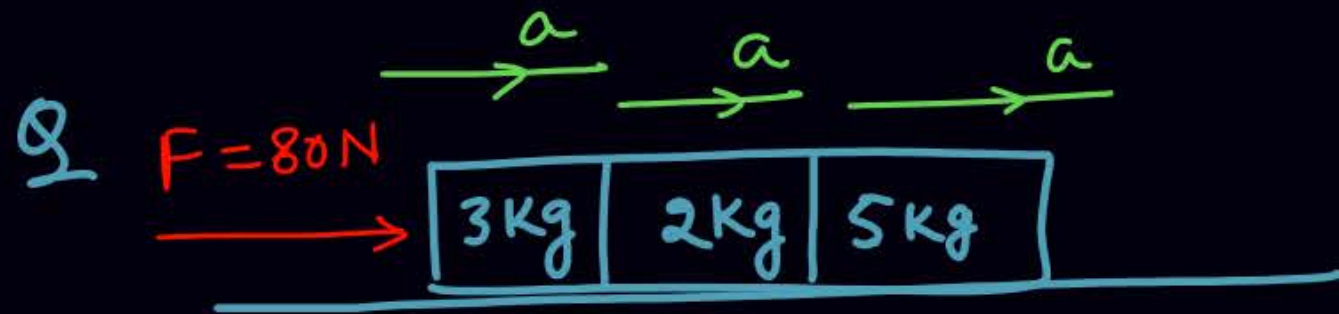
$$60 - N_1 = 2 \times 6$$

$$\boxed{N_1 = 48}$$

$\textcircled{2}$ Normal force b/w 3kg & 5kg



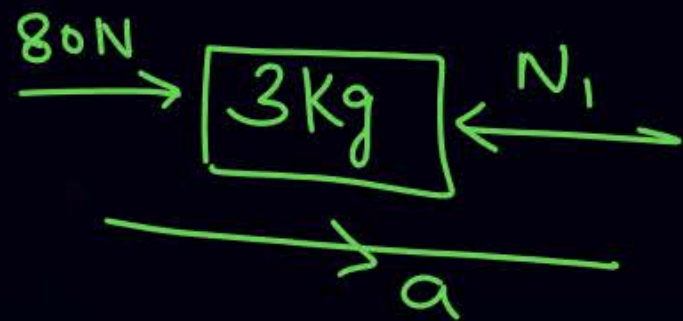
$$N_2 = 5 \times 6 = \underline{\underline{30}}$$



$$a = \frac{80 - 0}{10} = 8$$



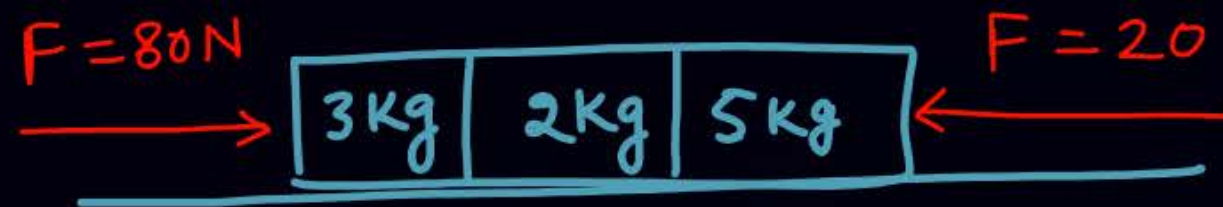
$$N_2 = 5 \times 8 = 40$$



$$80 - N_1 = 3 \times a$$

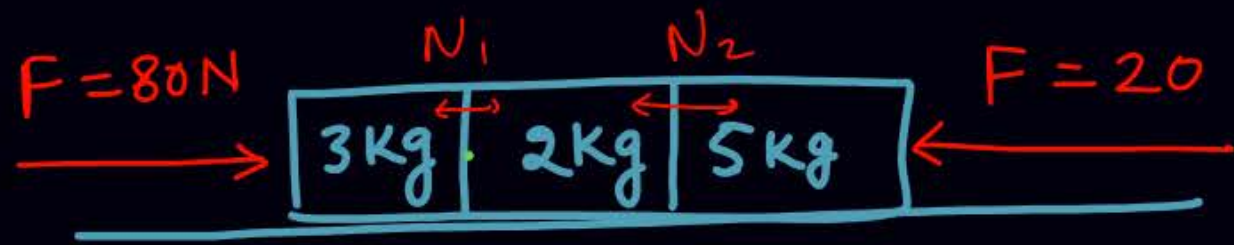
$$80 - N_1 = 24$$

$$N_1 = 56$$

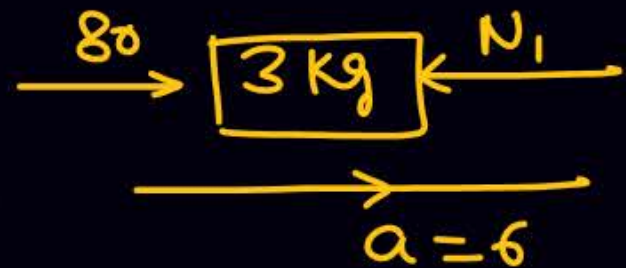


③





$$a = \frac{80 - 20}{10} = 6$$



$$80 - N_1 = 3 \times 6$$

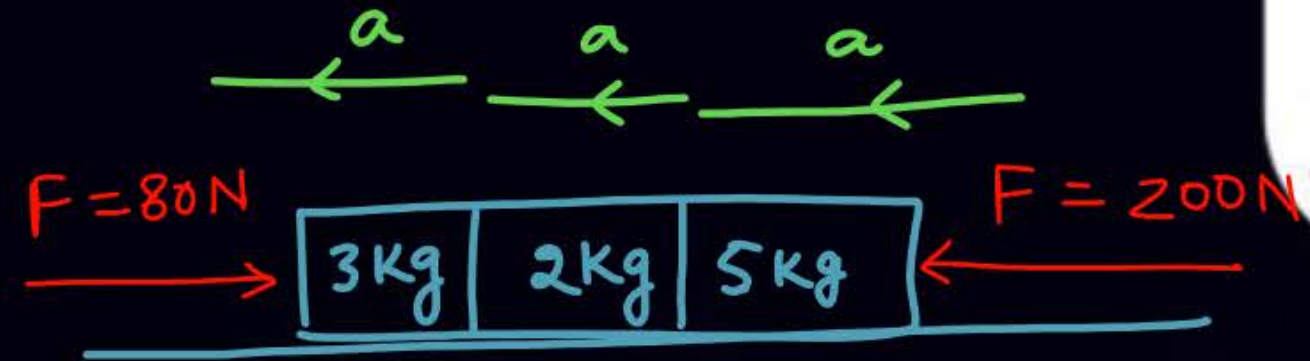
$$\boxed{N_1 = 62}$$



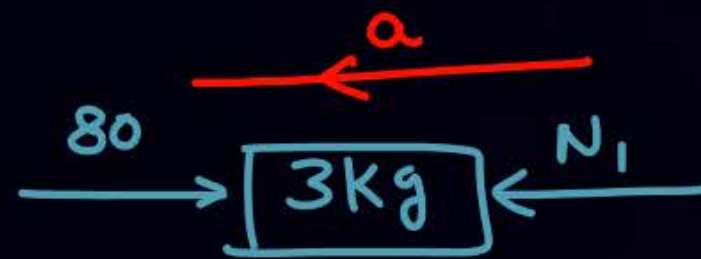
$$N_2 - 20 = 5 \times 6$$

$$\boxed{N_2 = 50}$$

③

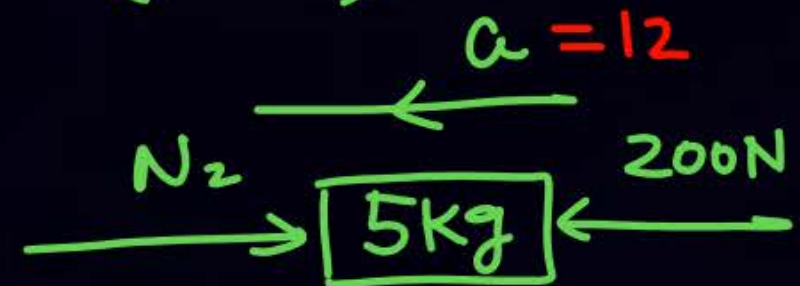


$$a = \frac{200 - 80}{10} = 12 \text{ (peecha)}$$



$$N_1 - 80 = 3 \times 12$$

$$\boxed{N_1 = 116}$$

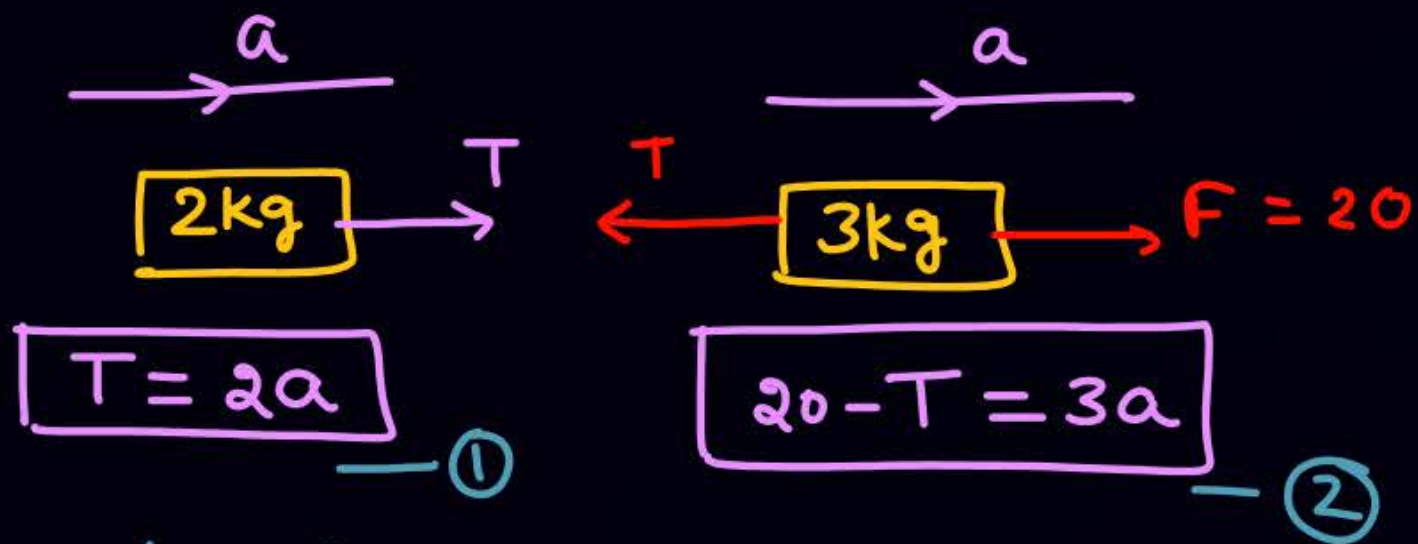


$$200 - N_2 = 5 \times 12$$

$$\boxed{N_2 = 140}$$



#



Solve ① & ②

$$20 - 2a = 3a$$

$$20 = 5a$$

$$a = 4 \quad T = 8$$

Q



$$F_{\text{net}} = m_{\text{total}} a$$

$$20 = 5a \quad a = 4$$



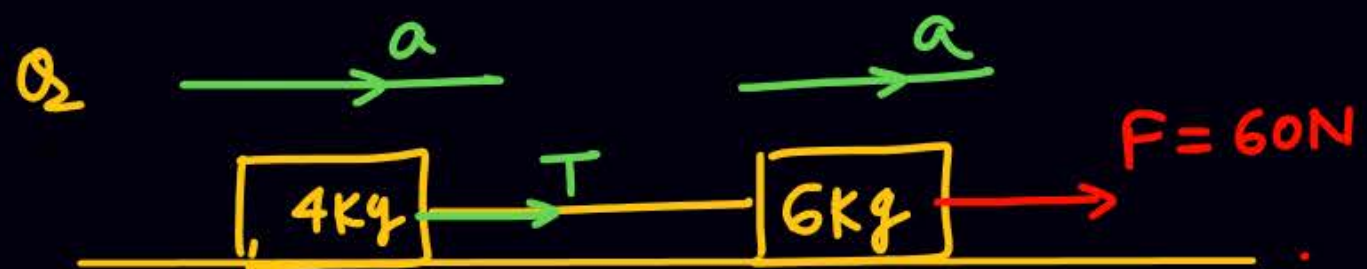
$$T = 2a$$

$$T = 2 \times 4 = 8$$

displacement in 3 sec, ($u = 0$)

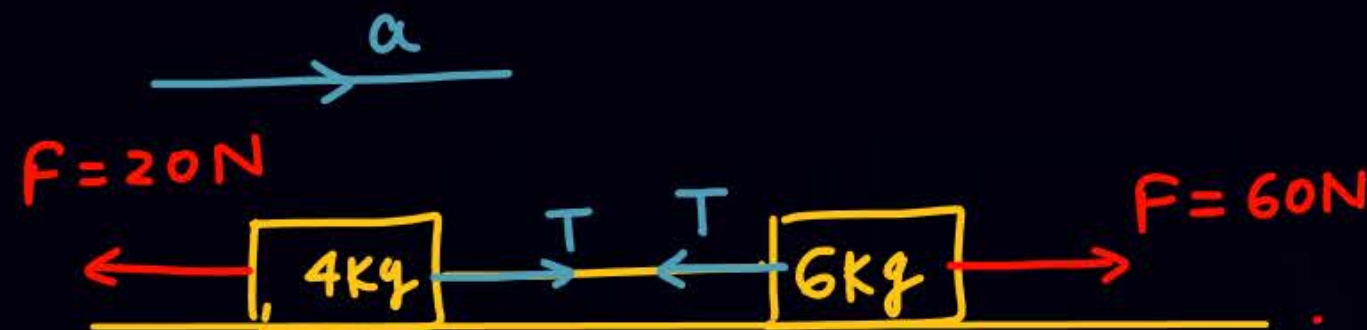
$$S = ut + \frac{1}{2}at^2 = 0 + \frac{1}{2} \times 4 \times 3^2 = 18$$





$$a = \frac{60 - 0}{10} = 6$$

$$T = 4 \times 6 = 24$$



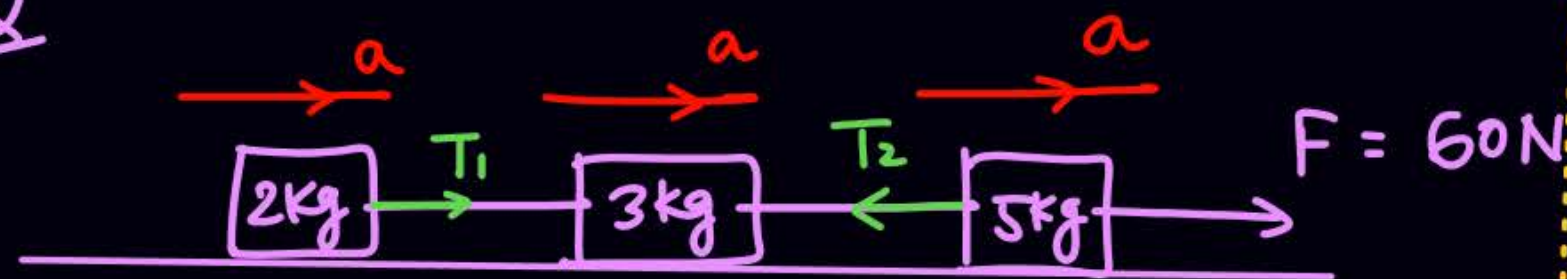
$$a = \frac{60 - 20}{10} = 4$$

$$T - 20 = 4 \times 4$$

$$\boxed{T = 36}$$



Q



$$a = \frac{60 - 0}{10} = 6$$

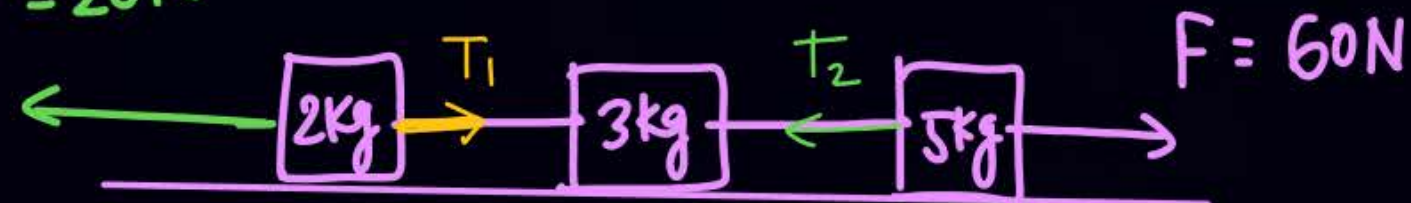
$$T_1 = 2a = 2 \times 6 = 12$$

$$60 - T_2 = 5a$$

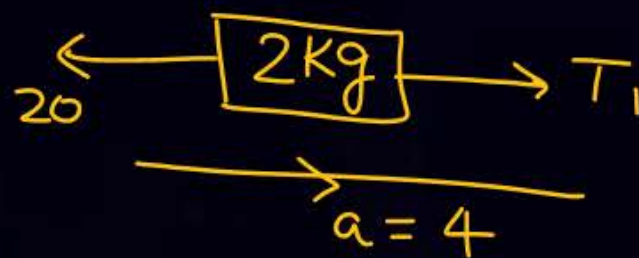
$$60 - T_2 = 5 \times 6$$

$$T_2 = 30$$

$$F = 20\text{N}$$

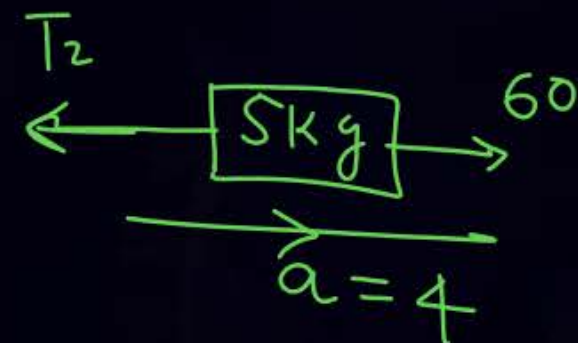


$$a = \frac{60 - 20}{2 + 3 + 5} = 4$$



$$T_1 - 20 = 2 \times 4$$

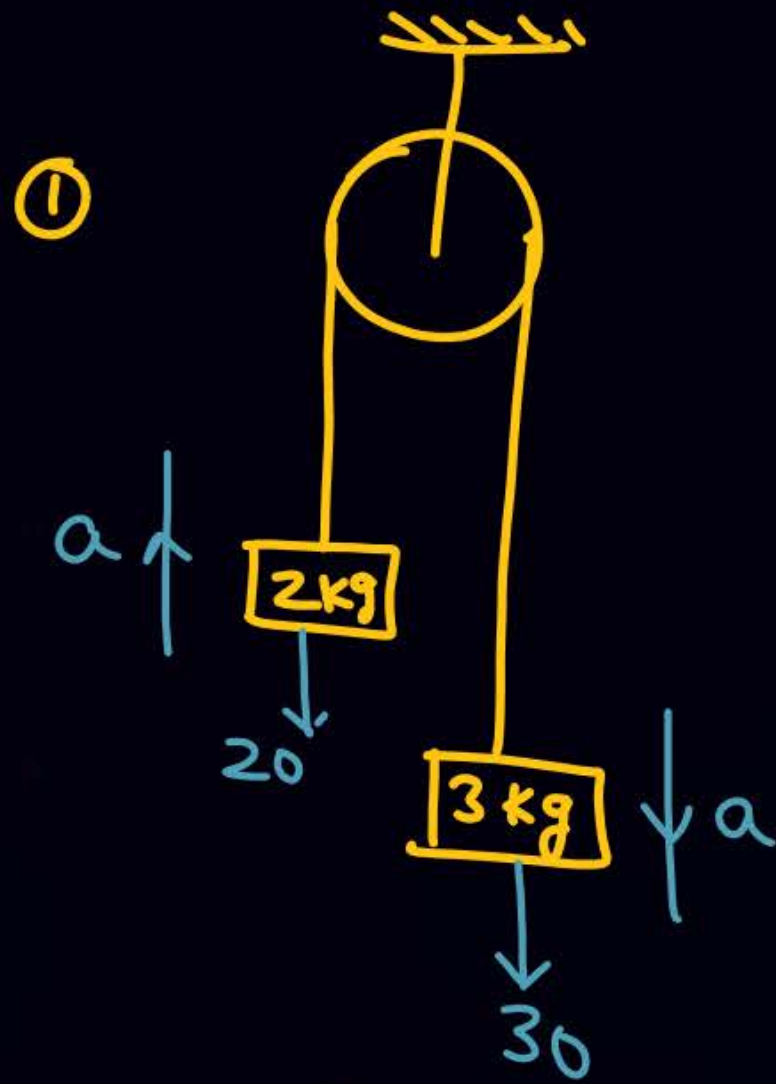
$$T_1 = 28$$



$$60 - T_2 = 5 \times 4$$

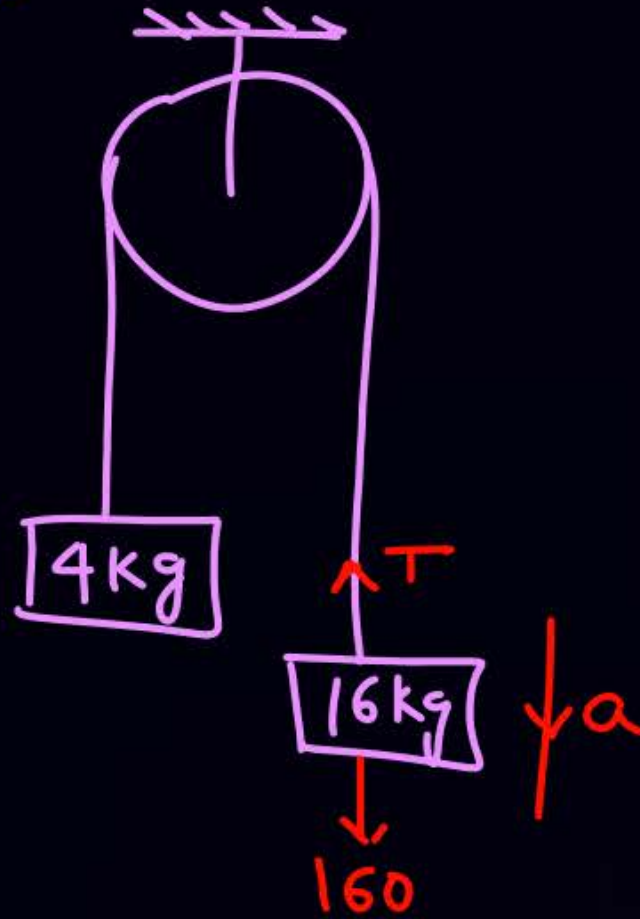
$$T_2 = 40$$

Q Find acc of each block & tension in string in Salem bhaiya style.



$$a = \frac{30 - 20}{2 + 3} = 2$$

②



$$a = \frac{160 - 40}{20}$$

$$a = 6$$

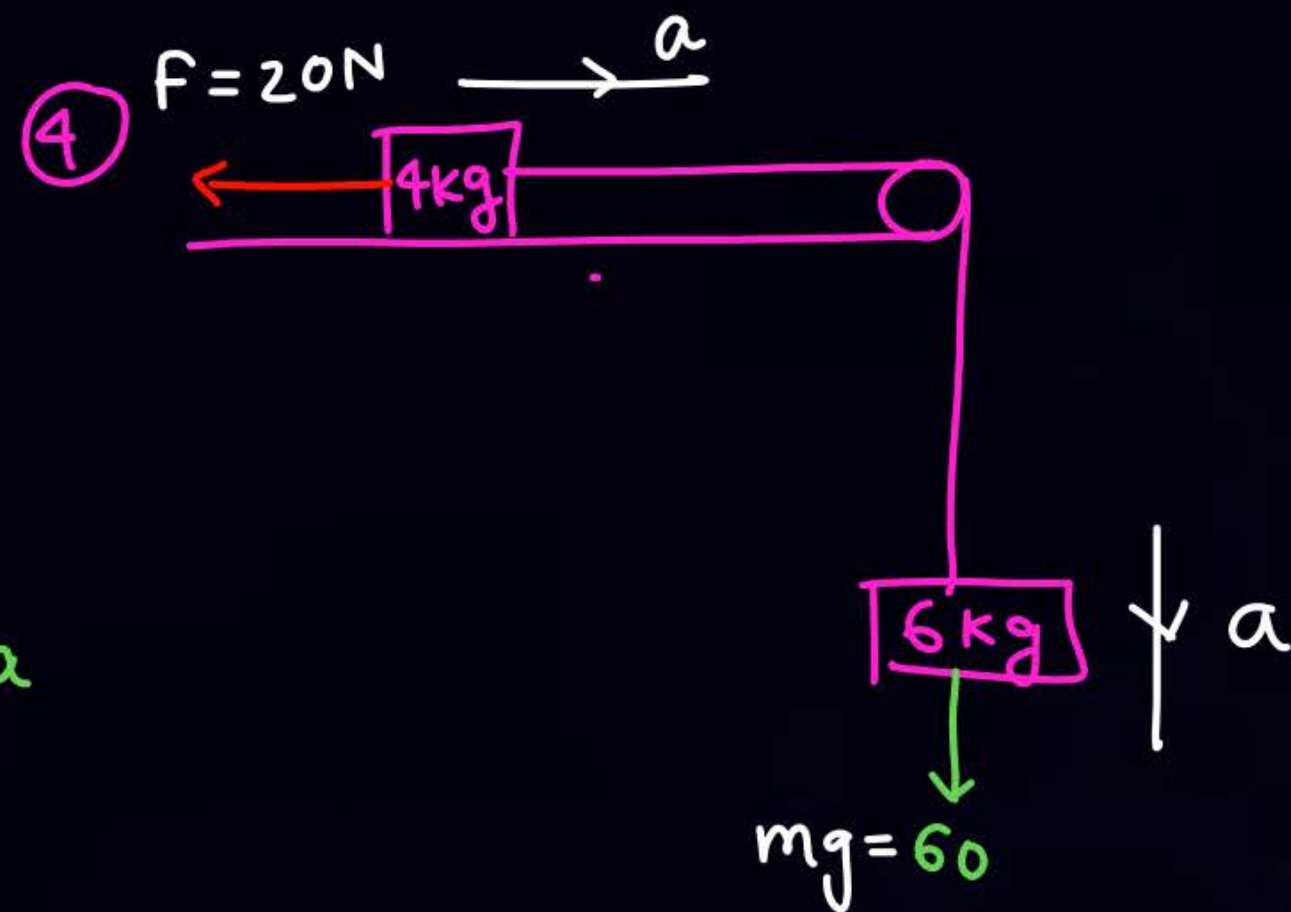
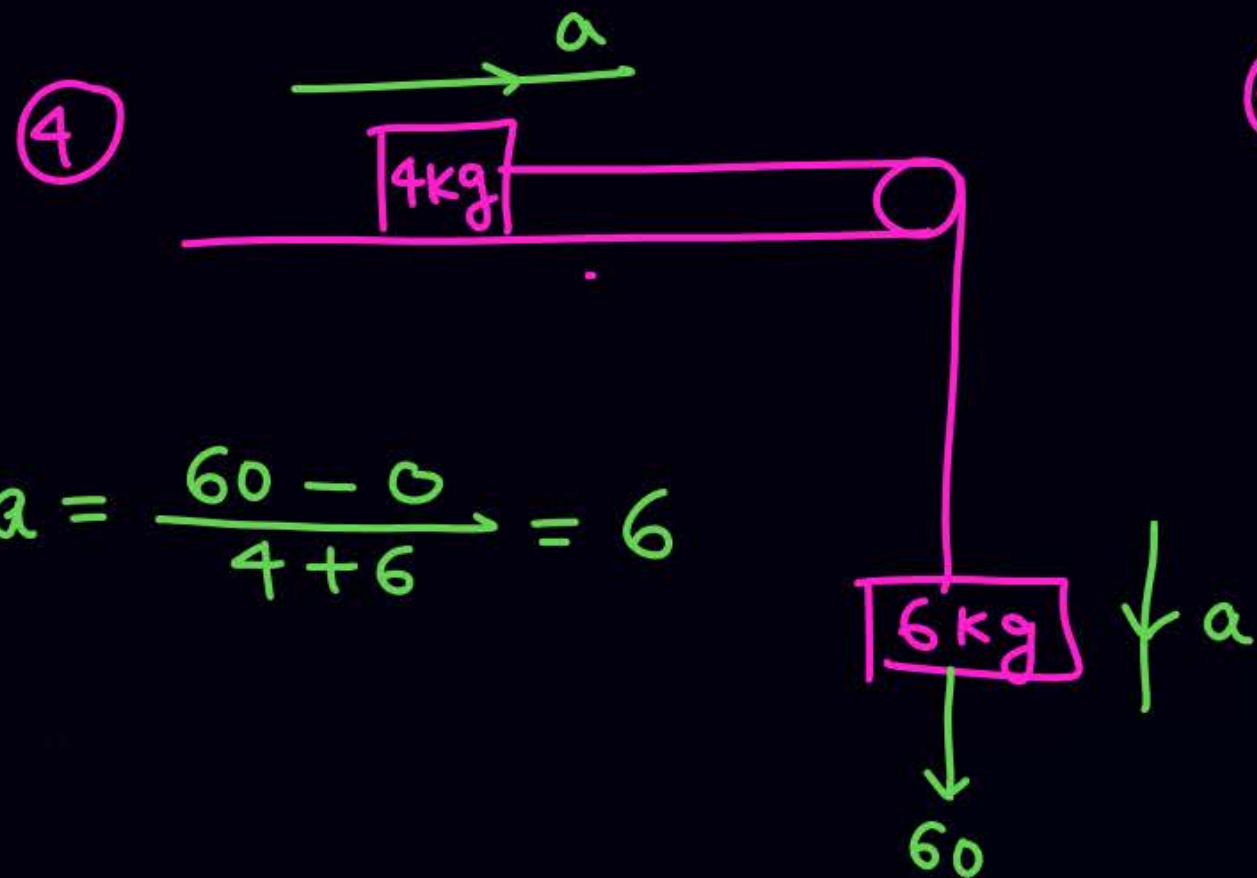
$$160 - T = 16 \cdot a$$

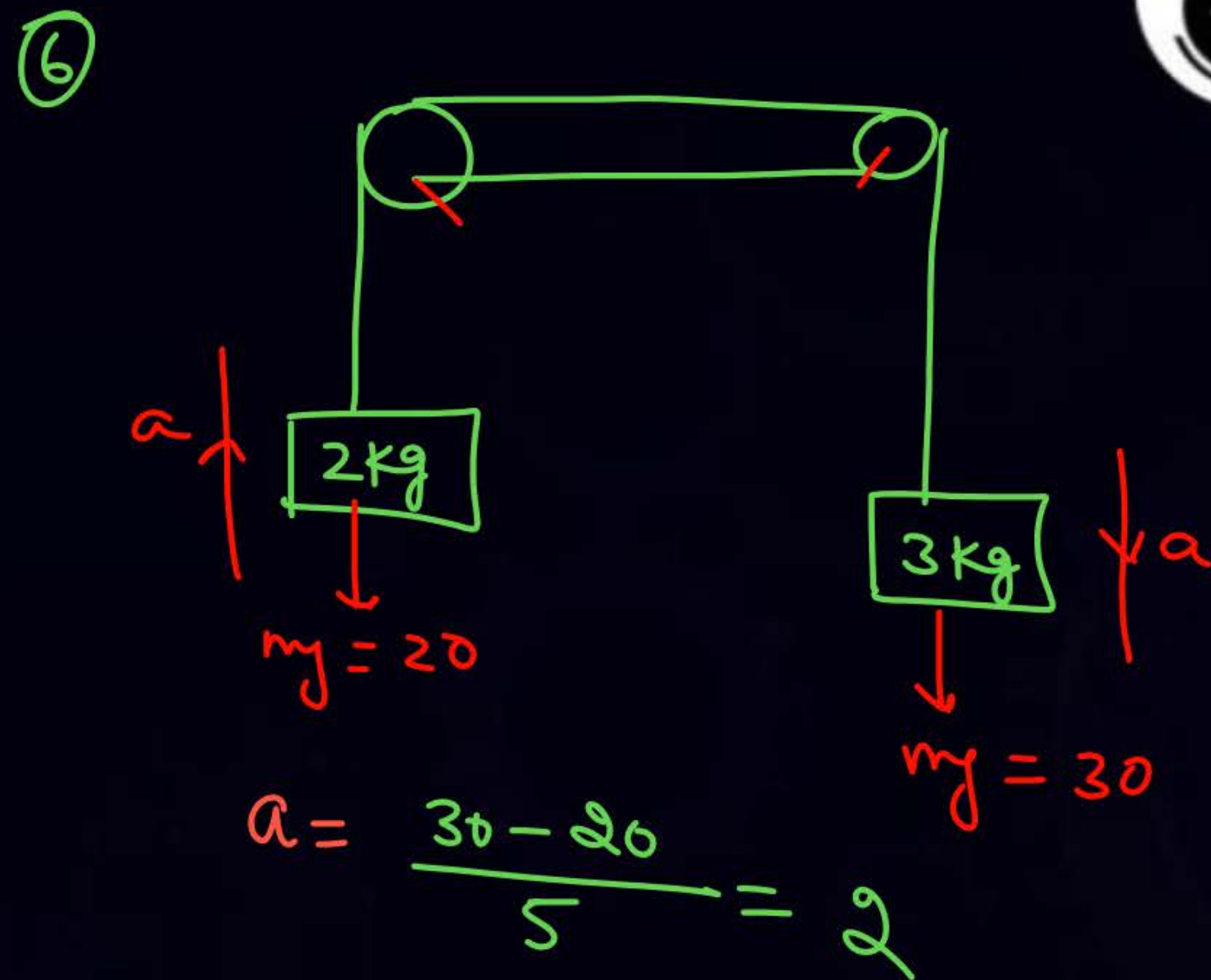
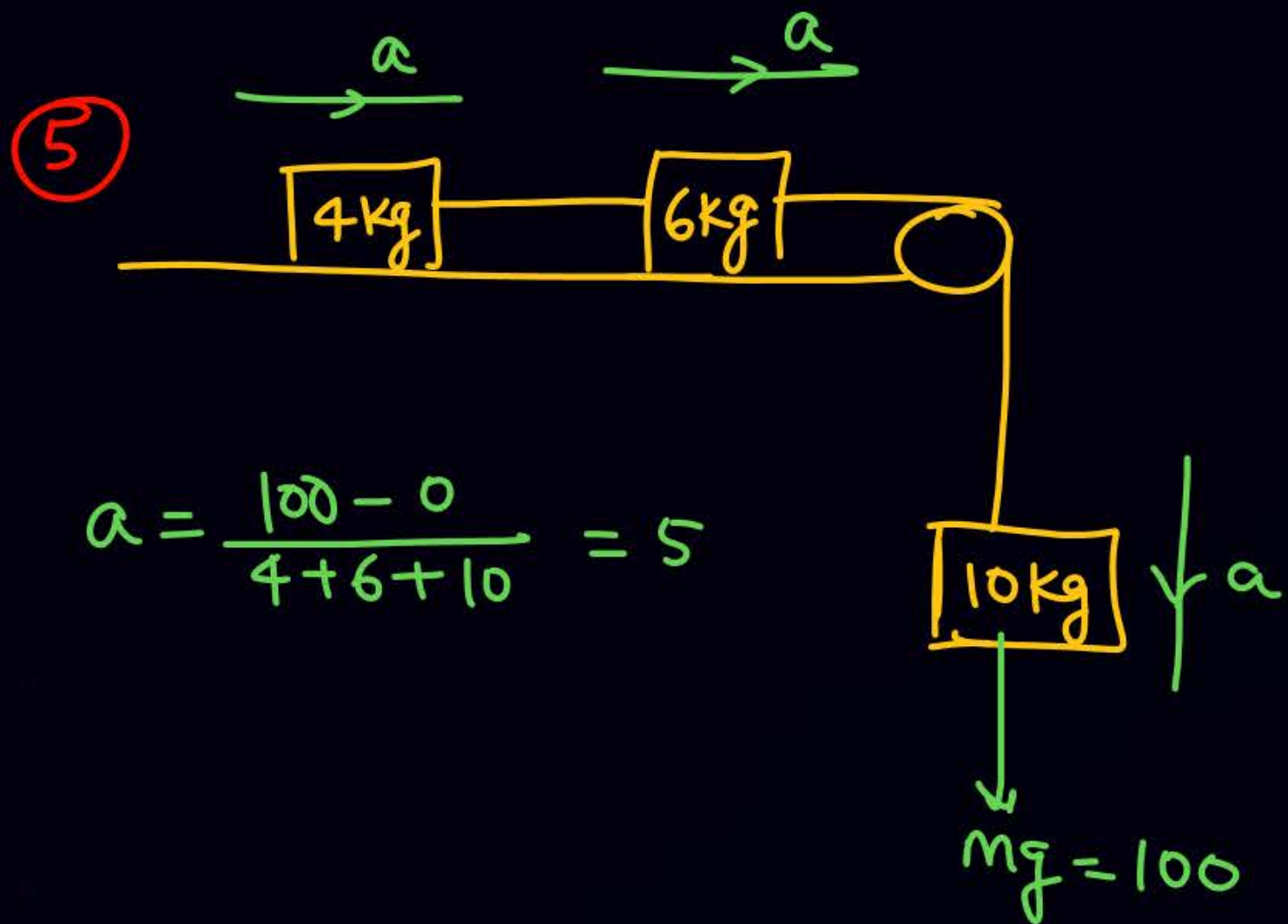
$$T = 160 - 16 \times 6 = \checkmark$$

③

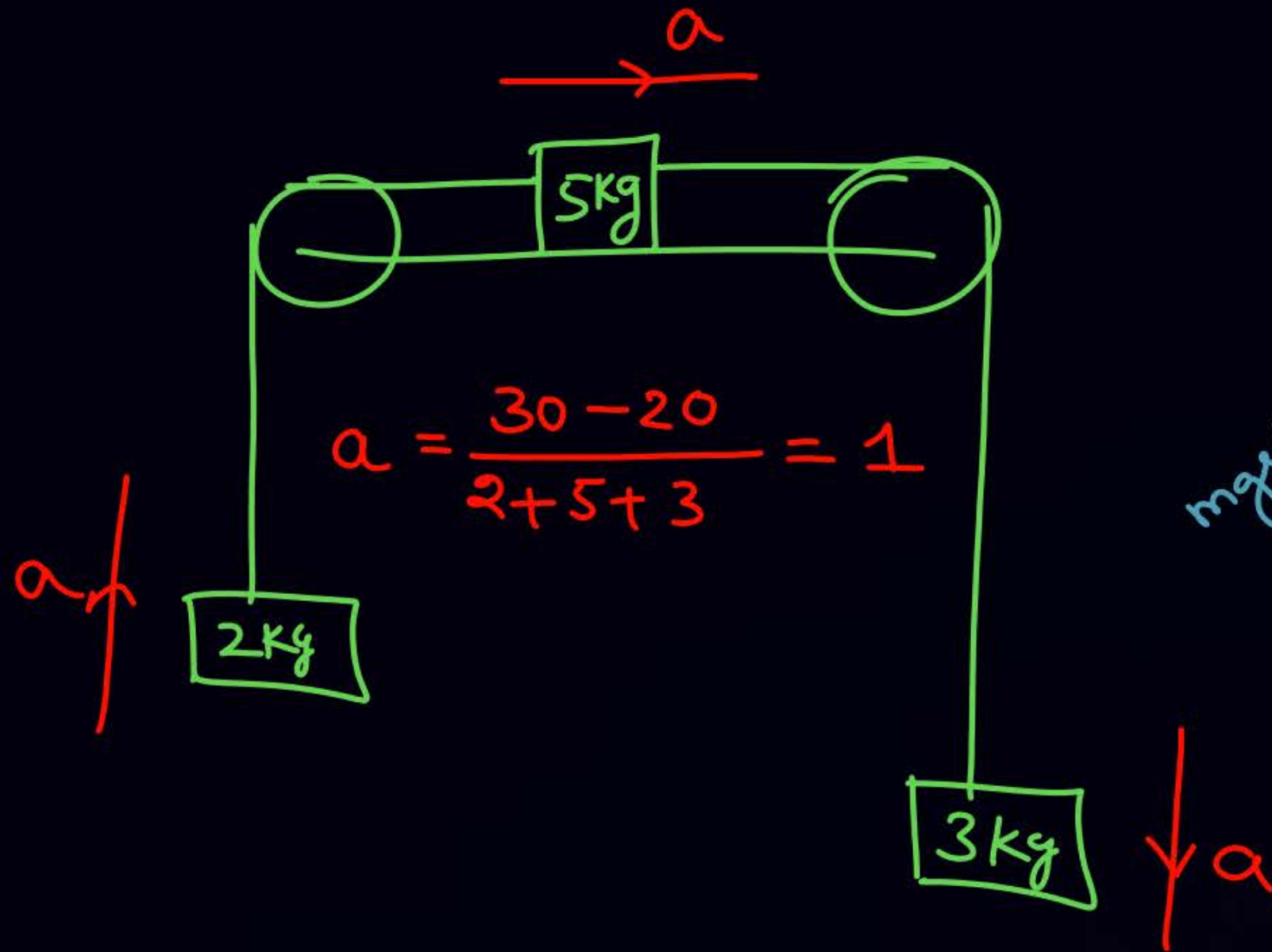


$$a = \frac{120 - 20}{2 + 4 + 8}$$

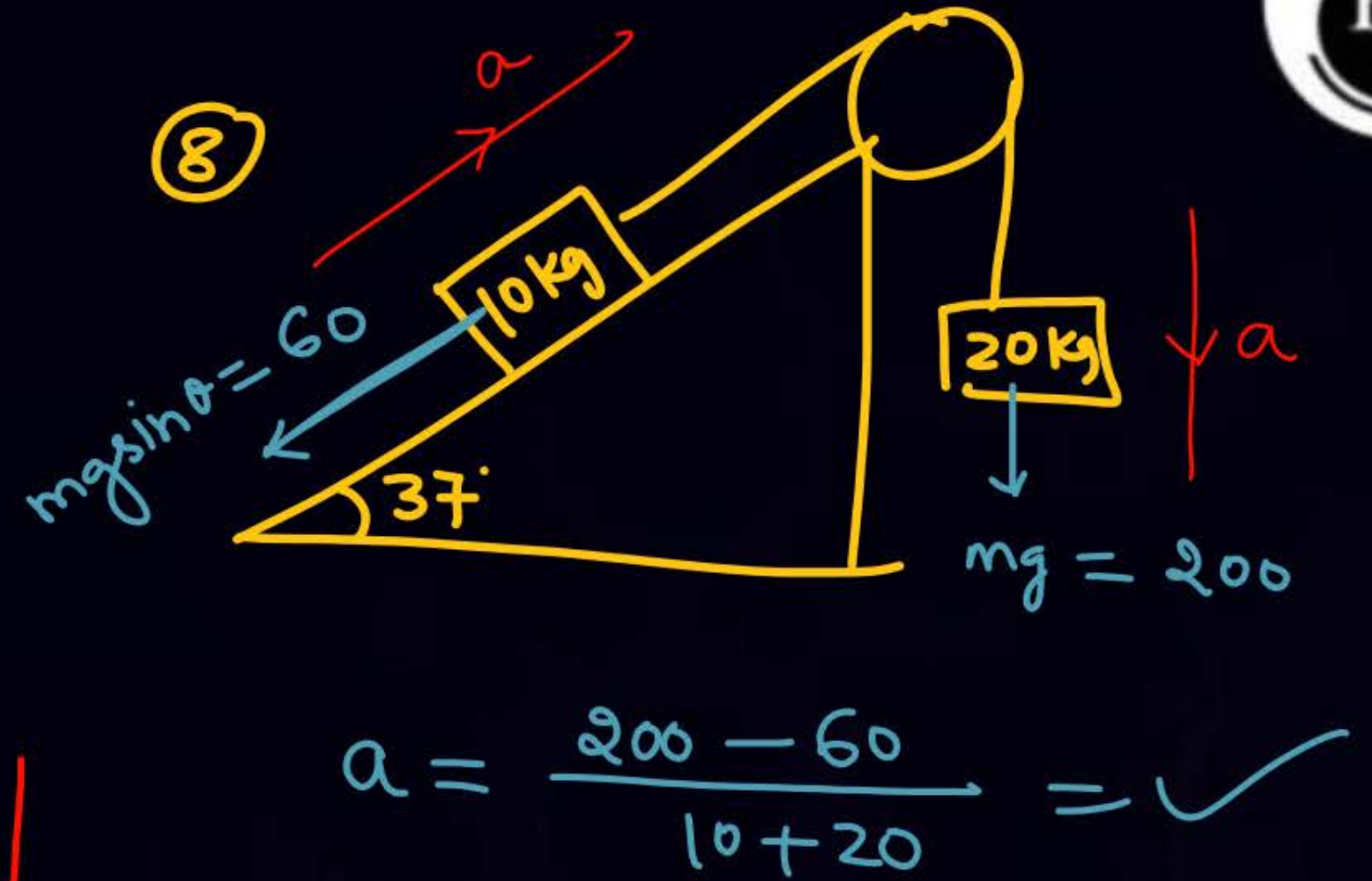




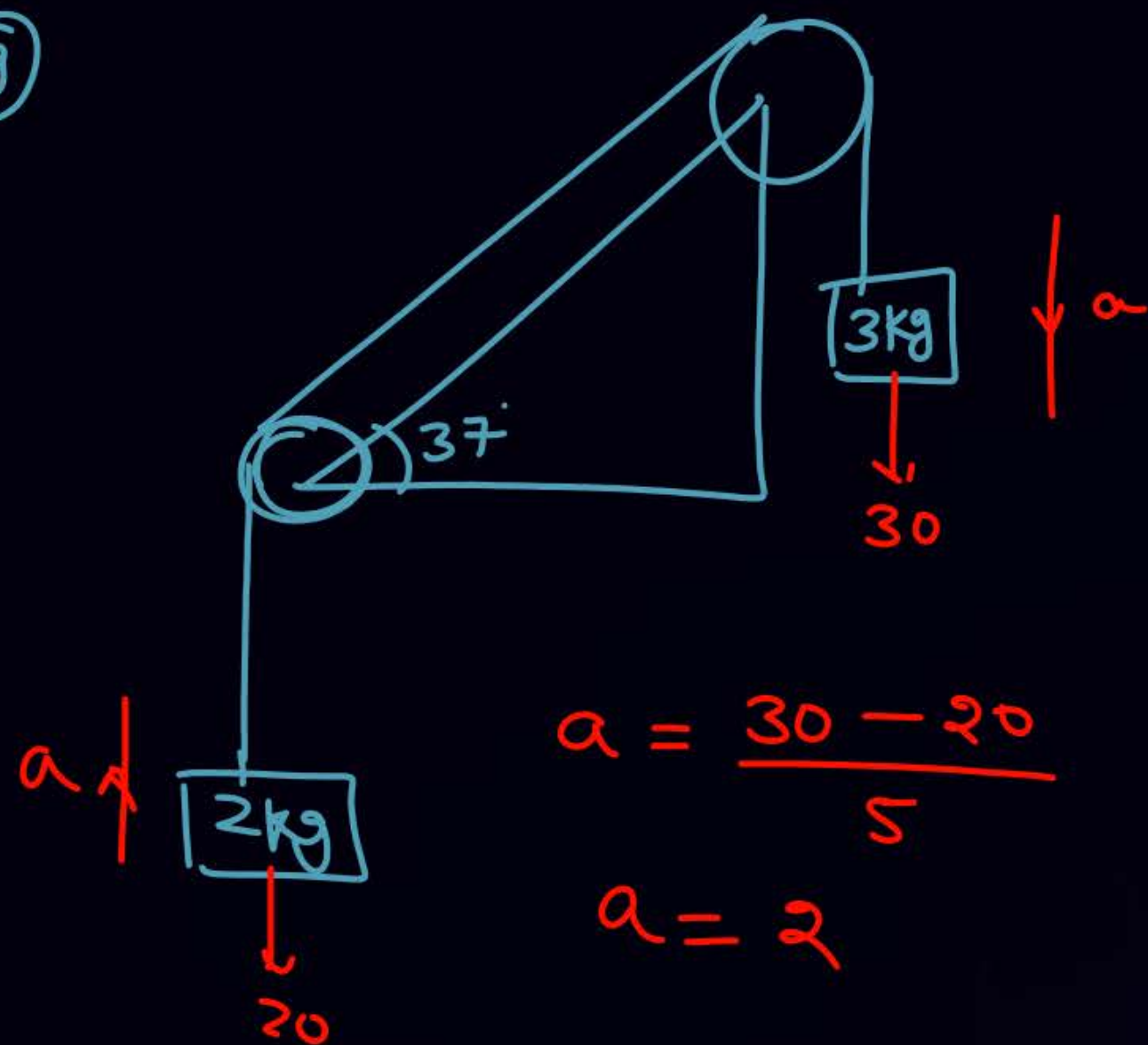
⑦



⑧



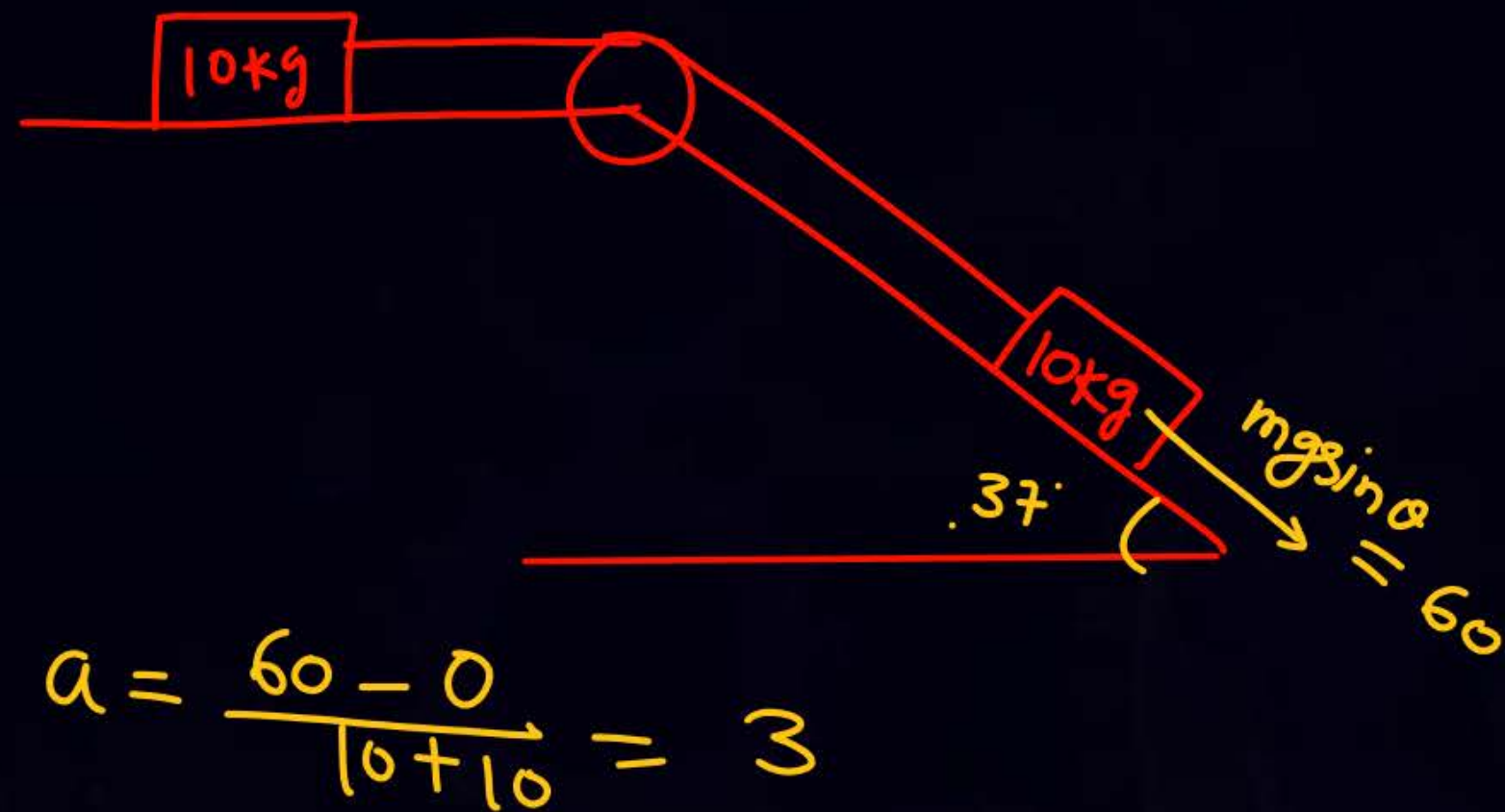
9



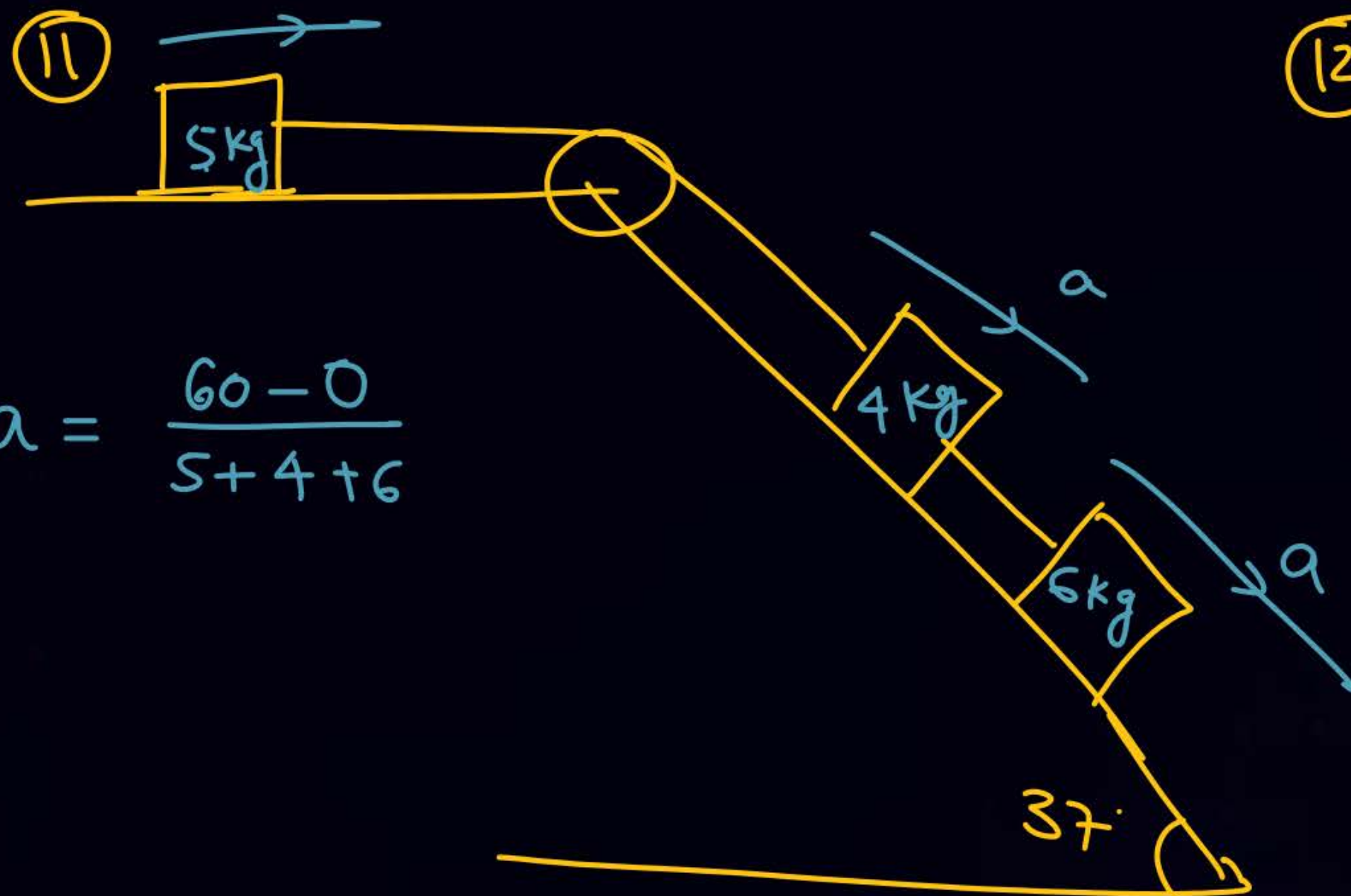
$$a = \frac{30 - 20}{5}$$

$$a = 2$$

10

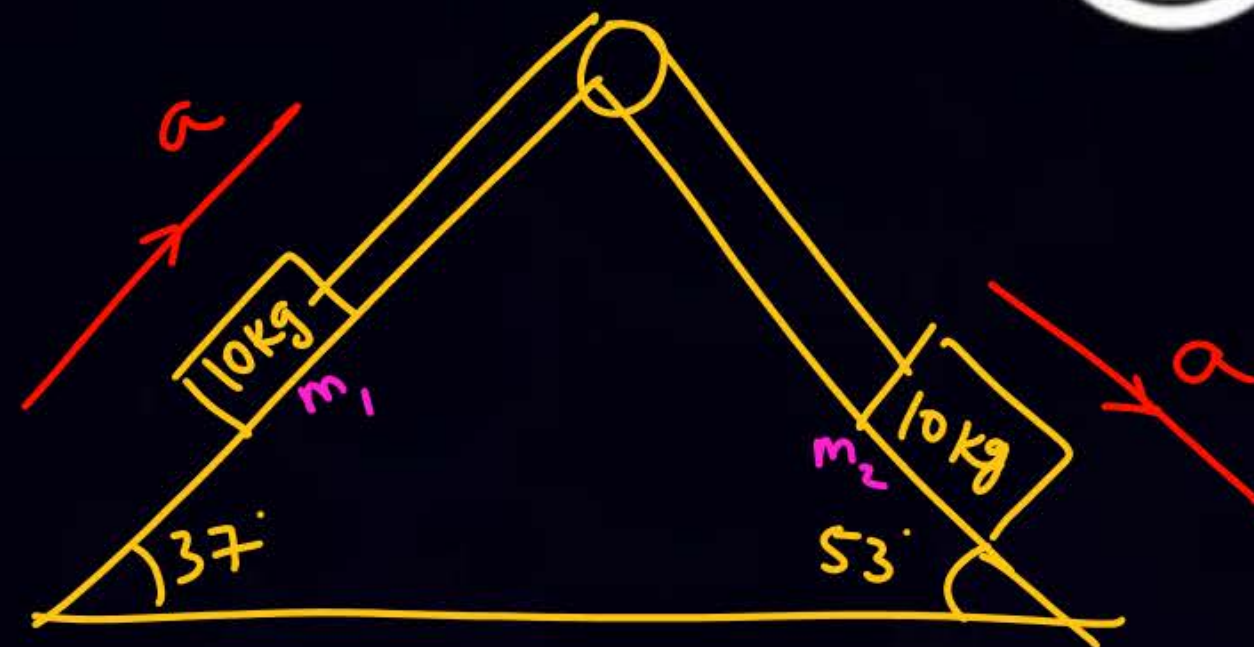


$$a = \frac{60 - 0}{10 + 10} = 3$$



$$a = \frac{60 - 0}{5 + 4 + 6}$$

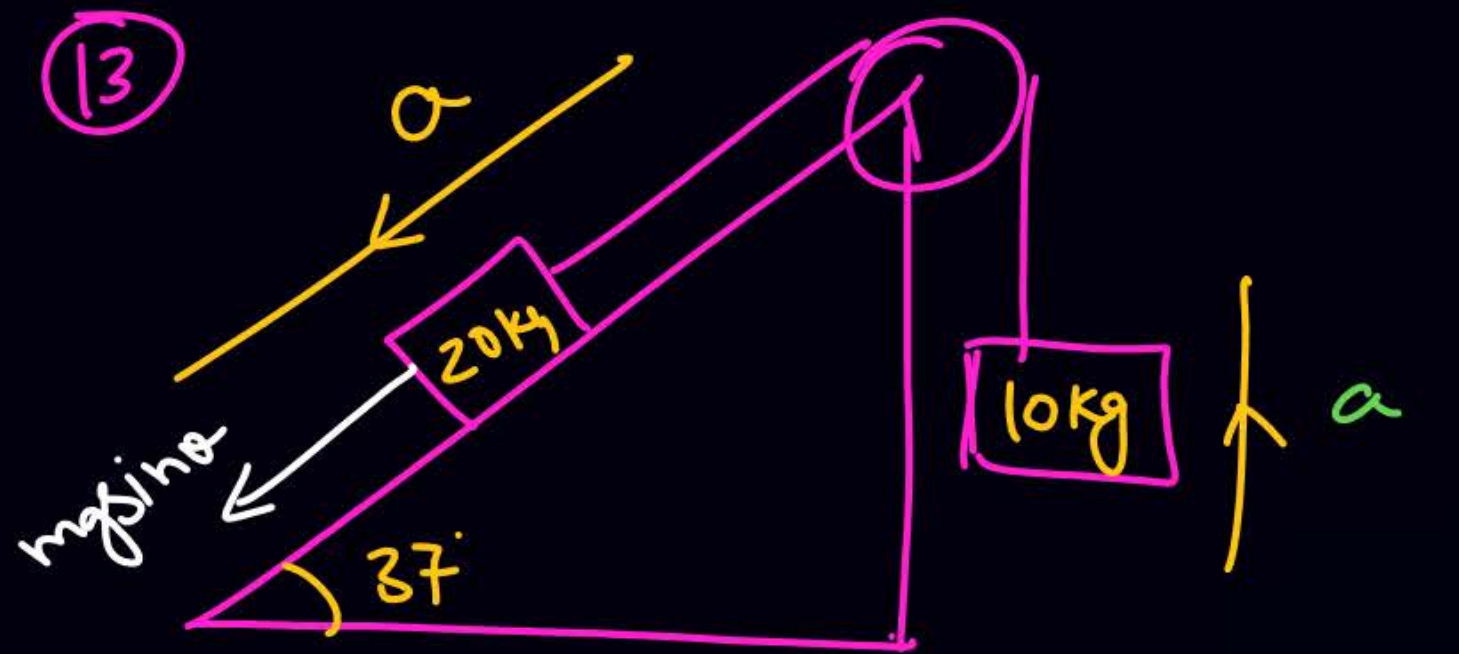
12



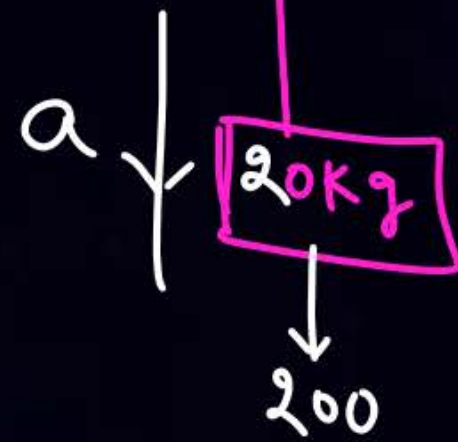
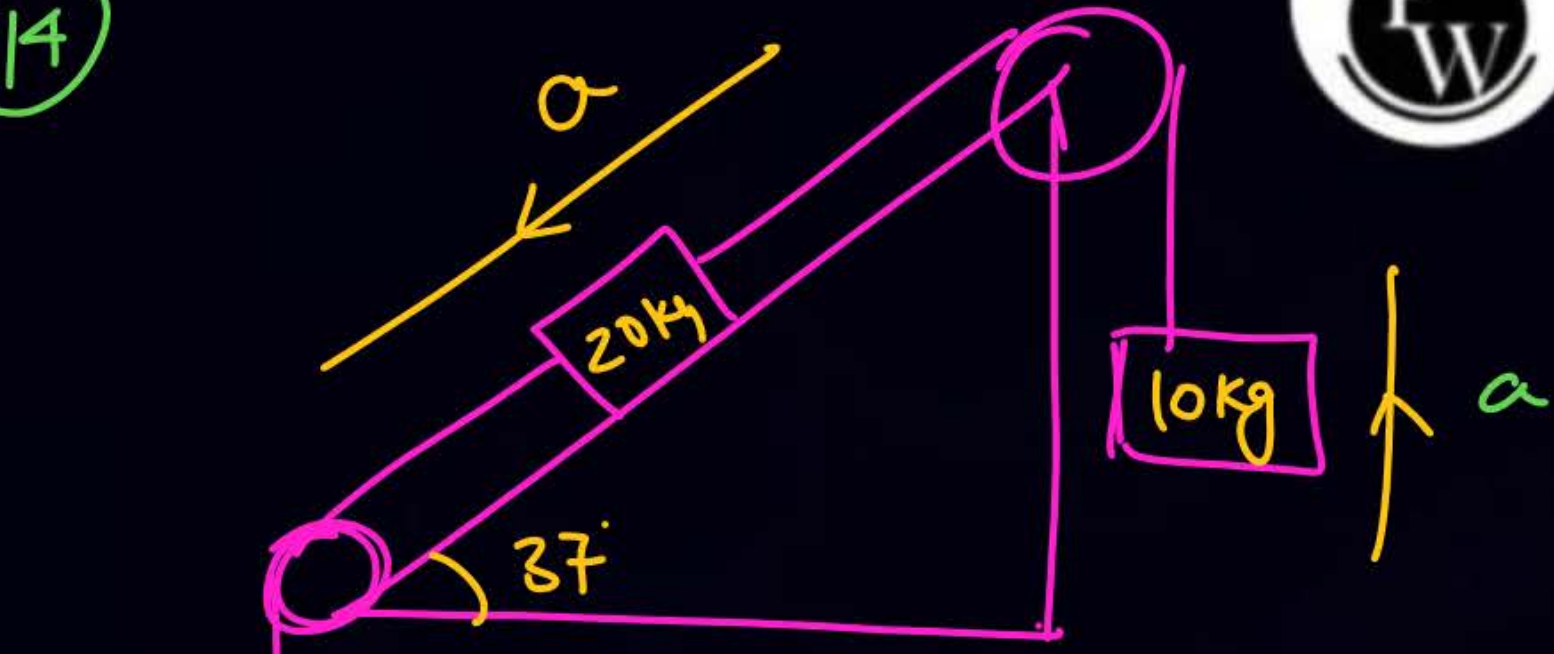
$$a = \frac{m_2 g \sin \theta_2 - m_1 g \sin \theta_1}{m_1 + m_2}$$

$$a = \frac{80 - 60}{20} = 1$$

MCV
14



$$a = \frac{200 \sin 37^\circ - 100}{30} = \frac{2}{3}$$

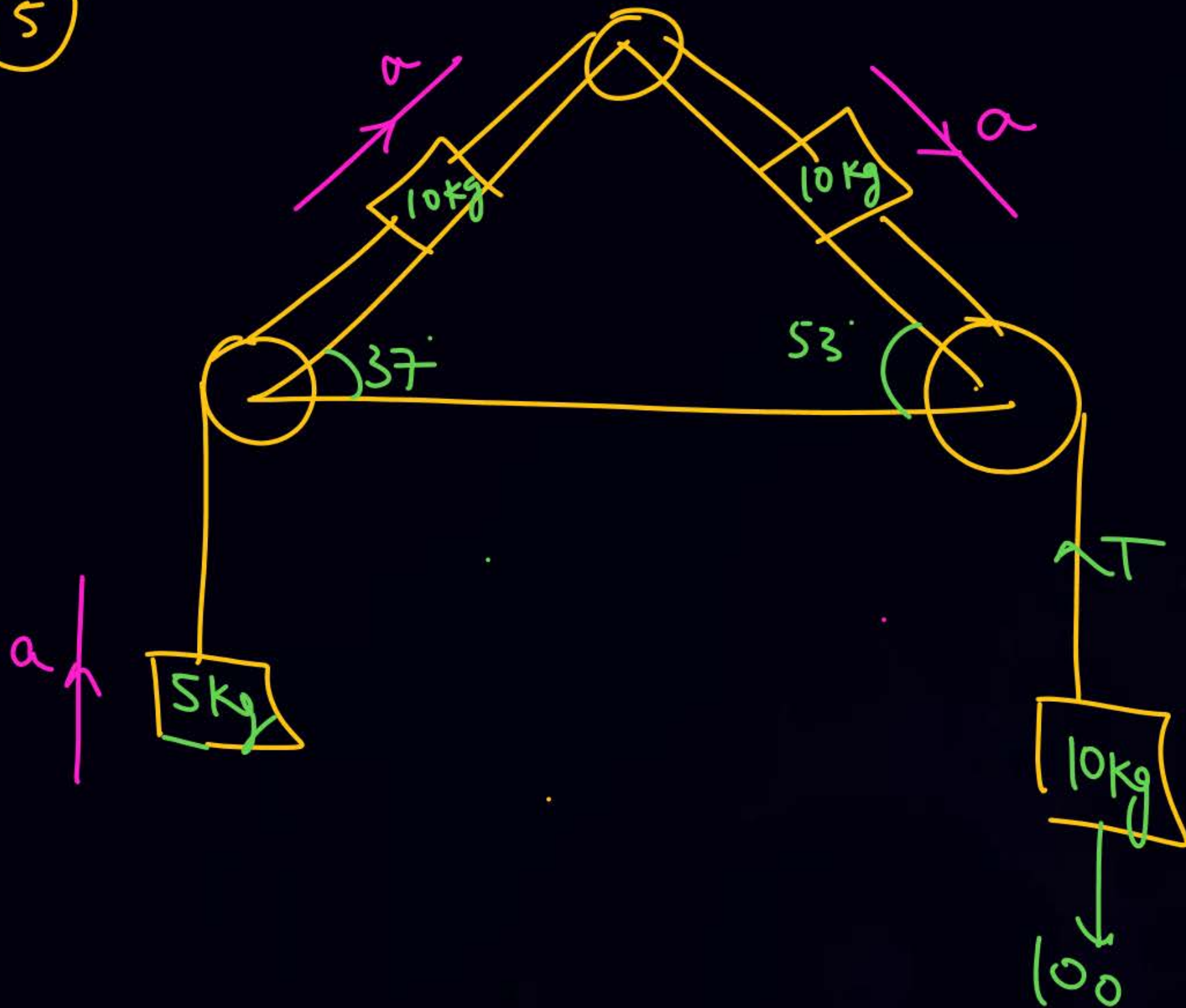


$$a = \frac{200 + 200 \sin 37^\circ - 100}{20 + 20 + 10}$$

$$a = \frac{200 + 120 - 100}{50}$$

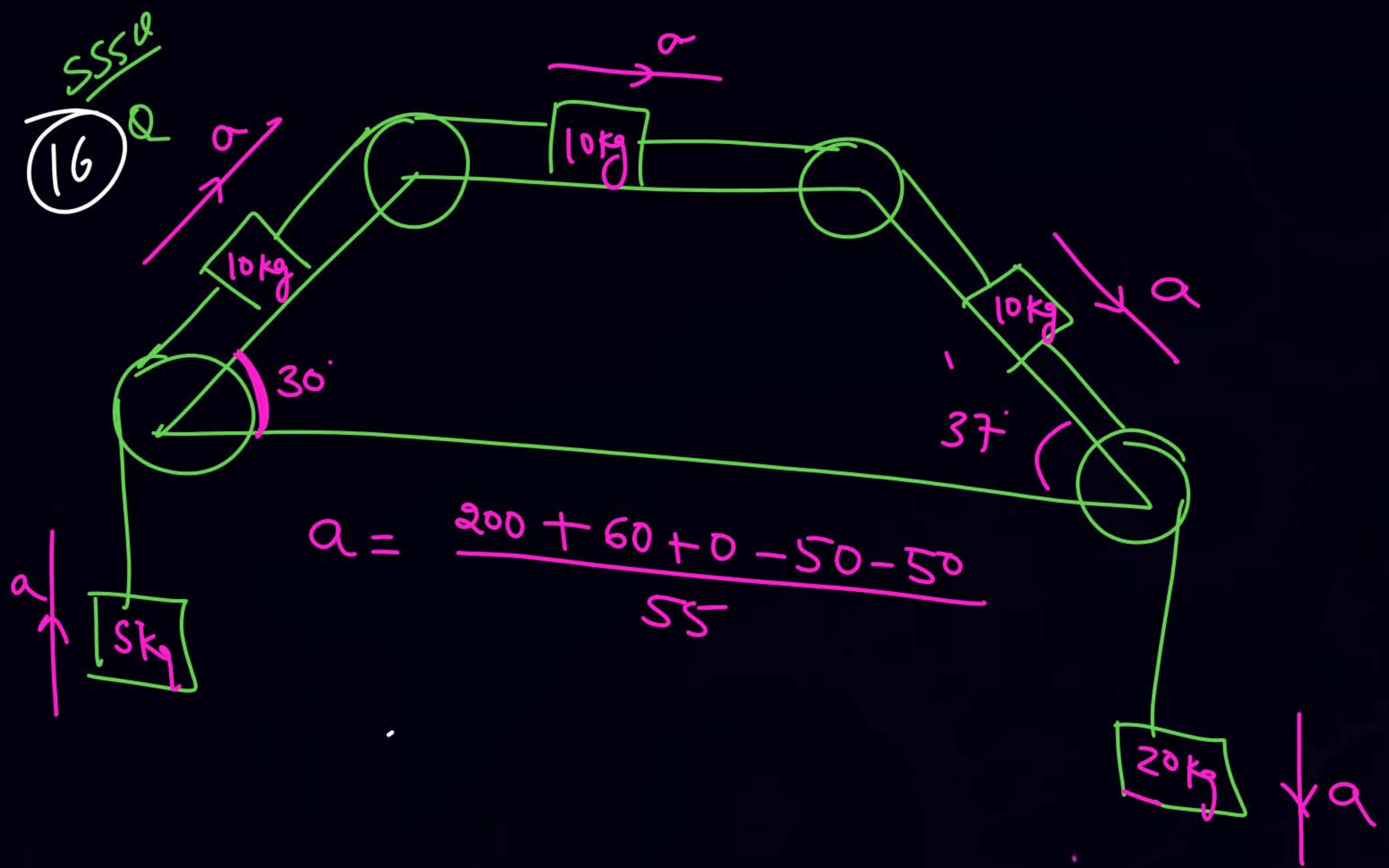
$$a = \frac{22}{5}$$

15



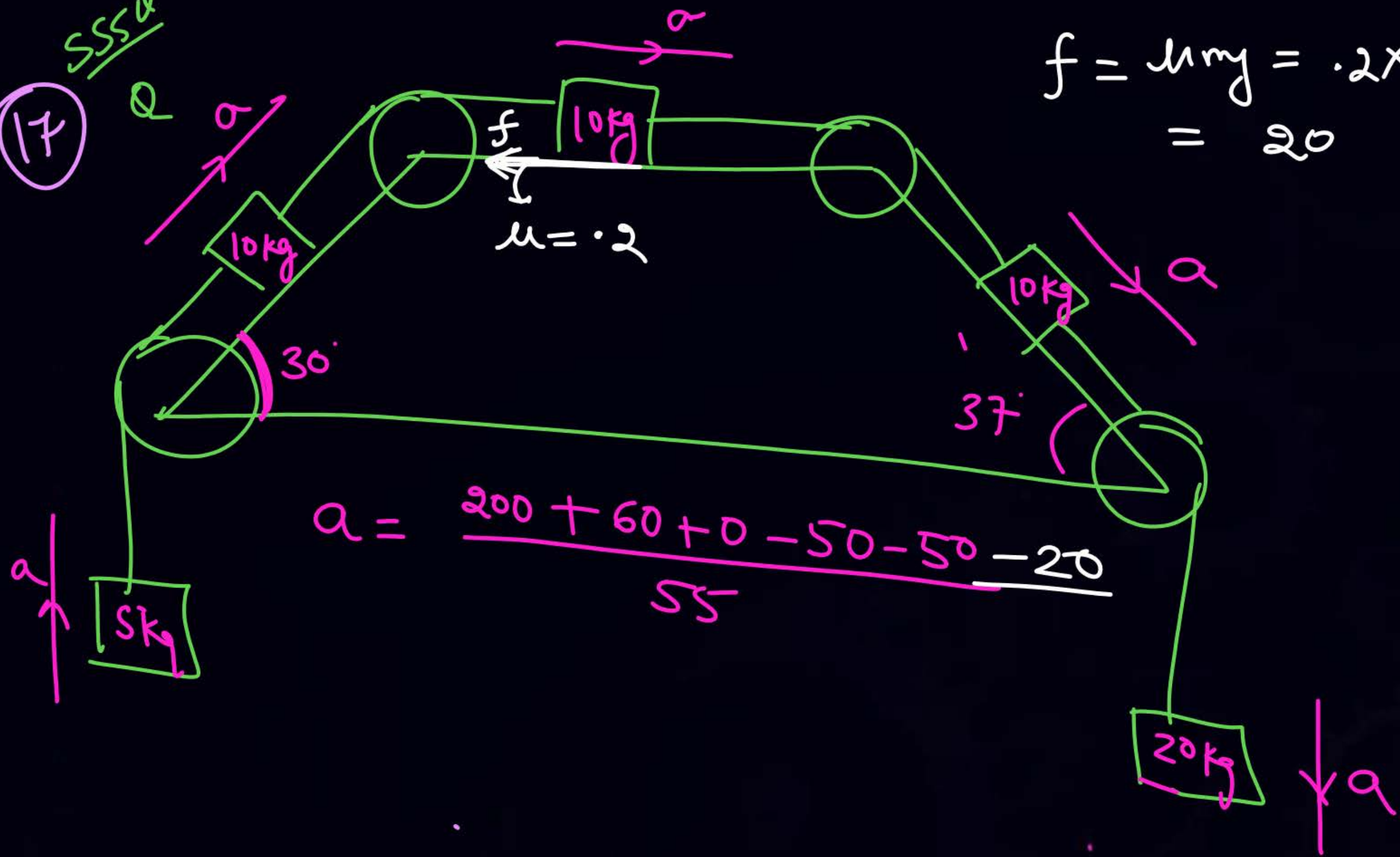
$$a = \frac{100 + 80 - 60 - 50}{35}$$

$$100 - T = 10a$$

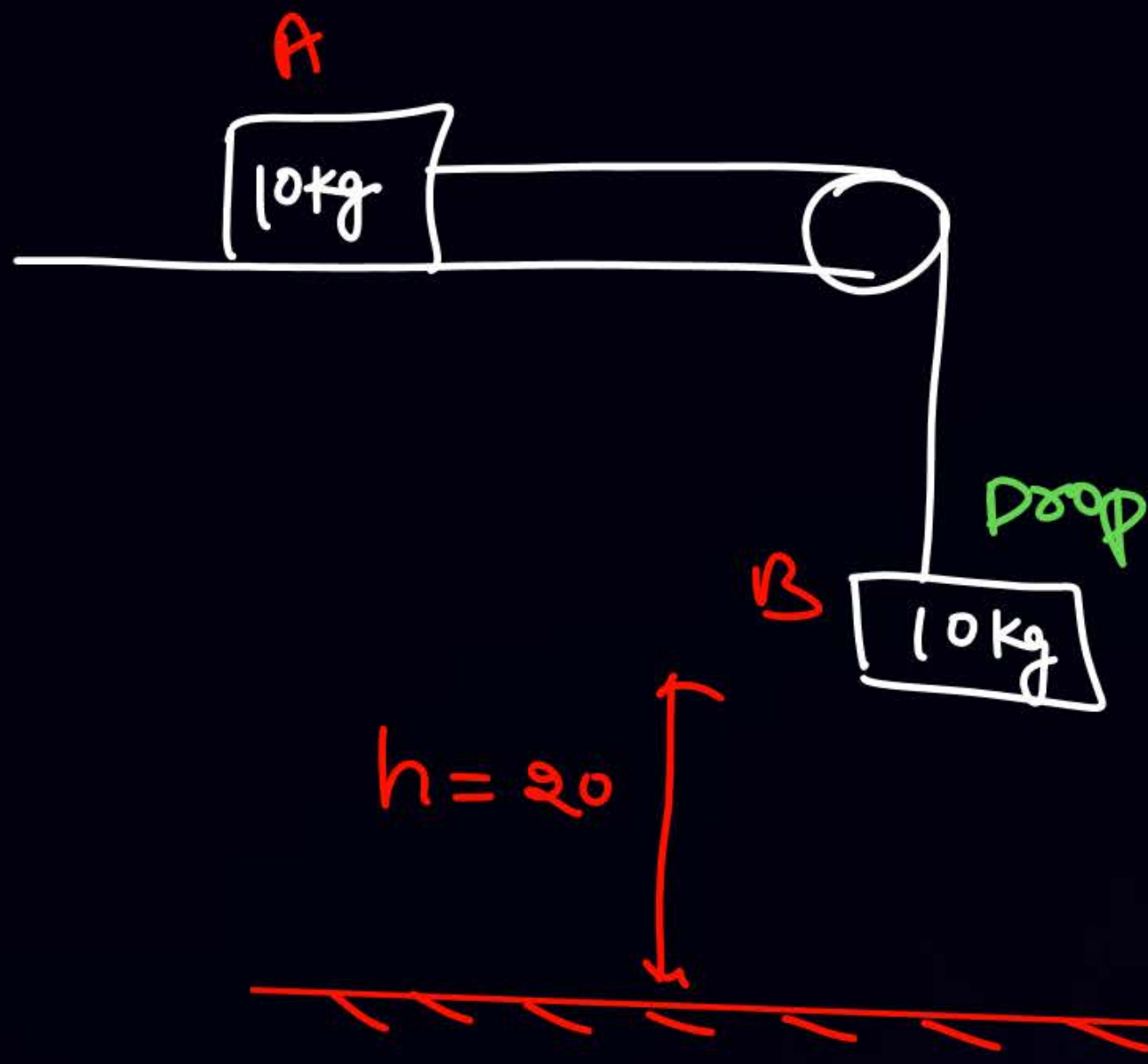


SSS
Q
17

$$f = \mu mg = .2 \times 100 = 20$$



18



find velocity of block B
just before it strikes
the ground.

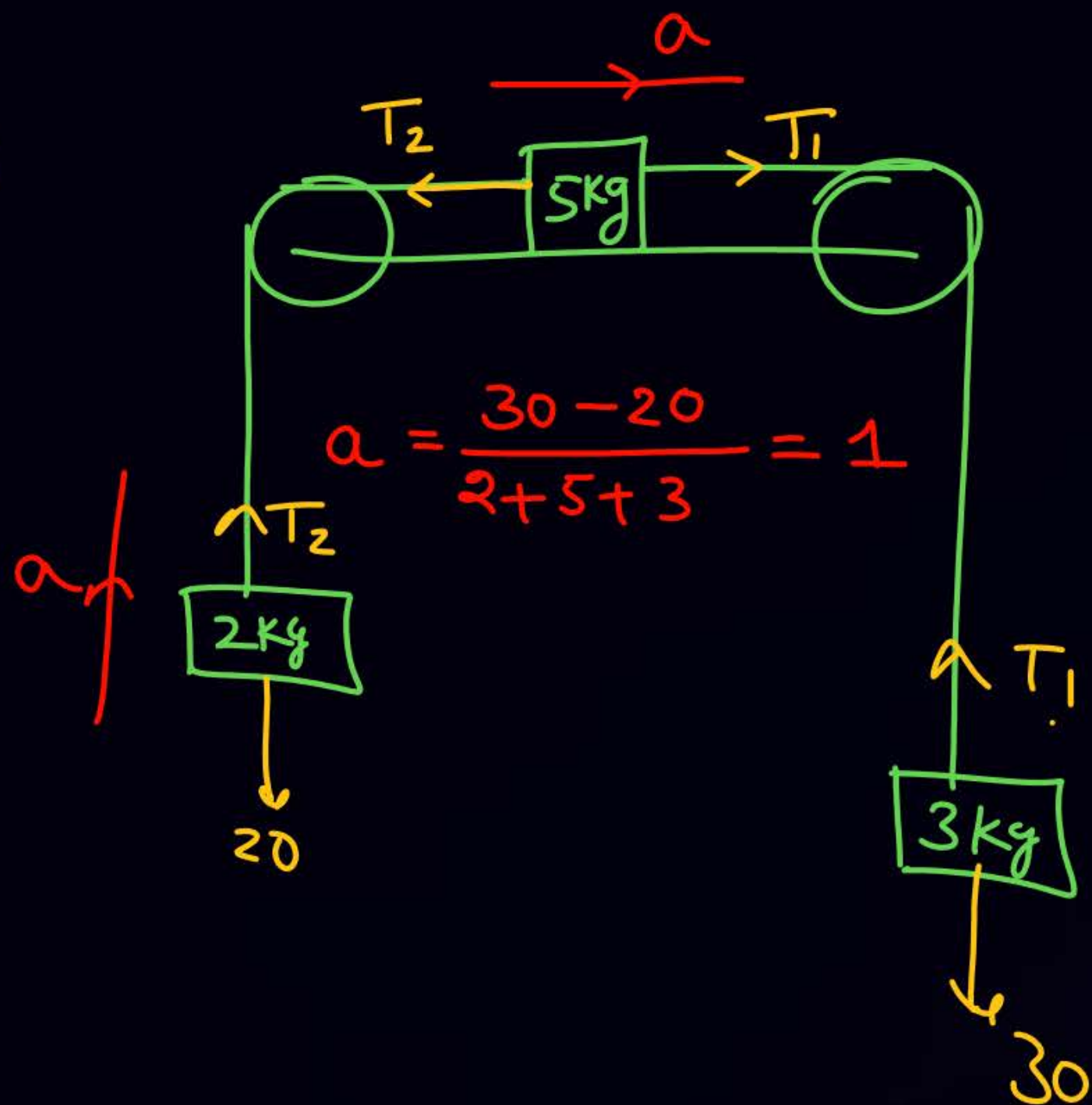
$$a = \frac{100 - 0}{20} = 5$$

$$v^2 = u^2 + 2as$$

$$v^2 = 0 + 2 \times 5 \times 20$$

$$v = \sqrt{200} = 10\sqrt{2}$$

⑦



$$a = \frac{30 - 20}{2 + 5 + 3} = 1$$

$$T_1 - T_2 = 5a$$

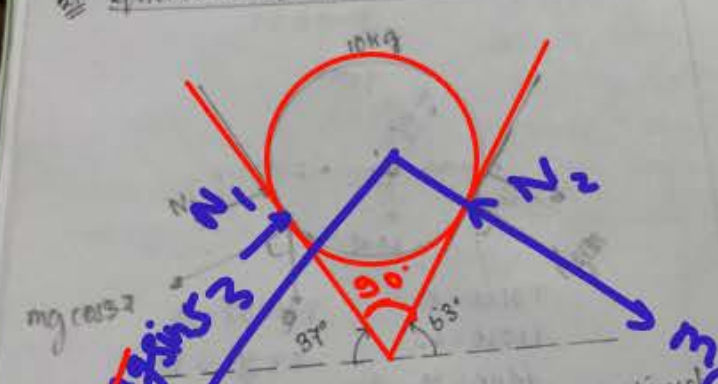
$$30 - T_1 = 3a$$

$$T_2 - 20 = 2a$$

$$30 - 20 = (5 + 3 + 2)a$$

$$a = \frac{30 - 20}{5 + 3 + 2} = 1$$

Q1. System is in equilibrium —



Find the normal force between ball & inclined

$$N_1 = mg \cos 37 = 10 \times 10 \times \frac{4}{5} = 80$$

$$N_2 = 10 \times 10 \times \frac{3}{5} = 60$$

Sir yese bhi kr sakte hai na ye wala question ! Please reply kriyega taki maloom toh pare ye approach sahi hai ya bilkul galat !! @saleem.nitt

Add to your story



Home work

- Solve all ques of today class
- HCV \rightarrow (NLM Page 79)
1, 5, 6, 22, 25, 26, 27, 39,



THANK
YOU