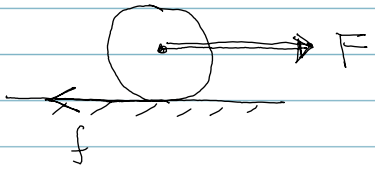
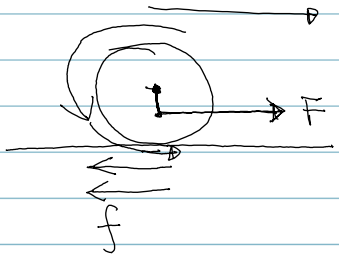
Gaya gesek rotasi

arah gaya gesek





translasi
f ke kiri

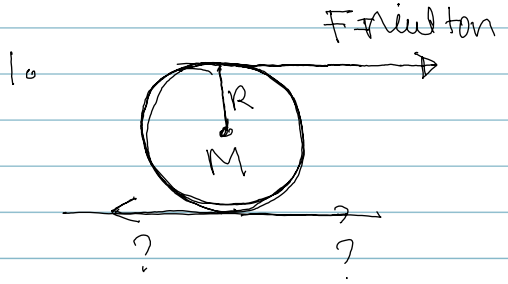
Rotasi f kekanan

$a = \frac{F}{m}$ $\alpha = \frac{F \cdot r}{I}$

$a = \alpha \cdot R$ → bergerak tanpa slip

$a > \alpha R$ → f ke kiri

$a < \alpha R$ → f kekanan



$I = \frac{1}{2} M R^2$

$a = \frac{F}{M}$

$\alpha = \frac{FR}{I} = \frac{F \cdot R}{\frac{1}{2} M R^2}$

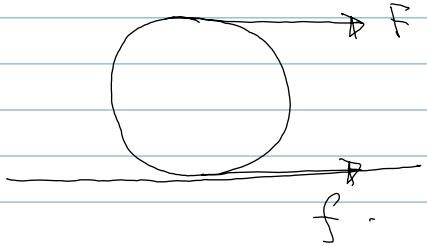
$= \frac{2F}{MR}$

$\alpha R = \frac{2F}{M}$

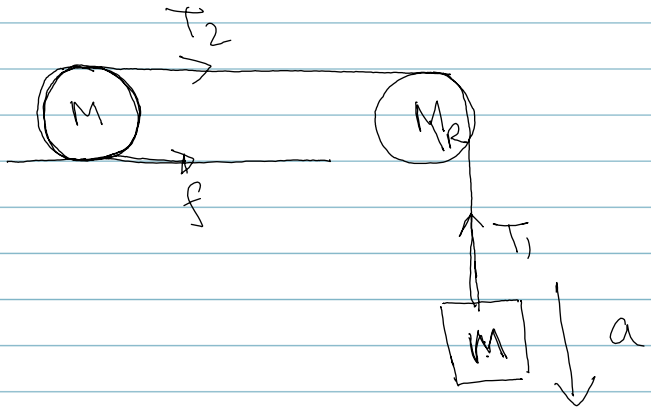
$a < \alpha R$

rotasi lebih dominan

gaya gesek ke depan

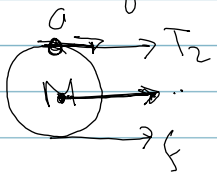


2.



Benda M:

$$a = \frac{Mg - T_1}{M} \Rightarrow \boxed{T_1 = Mg - Ma}$$

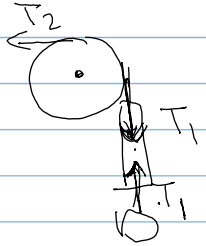


$$a_{pm} = \frac{T_2 + f}{M}$$

$$\frac{1}{2}a = \frac{T_2 + f}{M} \Rightarrow \boxed{T_2 = \frac{1}{2}Ma - f}$$

$$\alpha = \frac{T_2 \cdot R - fR}{\frac{1}{2}MR^2}$$

$$\alpha R = a_{pm} = \frac{1}{2}a = \frac{T_2 - f}{\frac{1}{2}M} \Rightarrow \boxed{T_2 = \frac{1}{4}Ma + f}$$

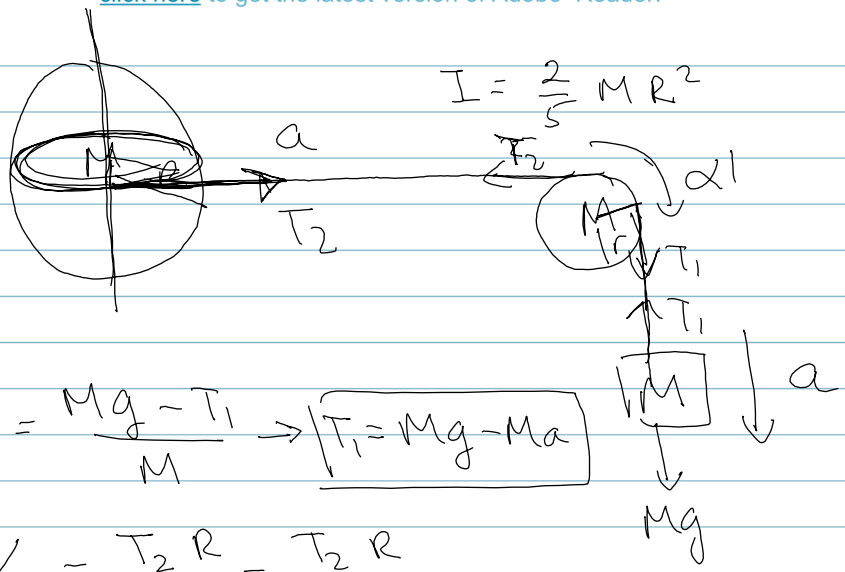


$$\alpha' = \frac{(T_1 - T_2)R}{\frac{1}{2}MR^2} \Rightarrow \boxed{T_1 - T_2 = \frac{1}{2}Ma}$$

$$\alpha' R = a$$

$$\boxed{a = \frac{8}{15}g} \; !!$$

3.



$I = \frac{2}{5} M R^2$

$a = \frac{Mg - T_1}{M} \rightarrow \boxed{T_1 = Mg - Ma}$

$\alpha = \frac{T_2 R}{I} = \frac{T_2 R}{\frac{2}{5} M R^2}$

$T_2 = \frac{2}{5} M \alpha R = \frac{2}{5} M a$

$\alpha' = \frac{T_1 r - T_2 r}{\frac{1}{2} M r^2} \rightarrow T_1 - T_2 = \frac{1}{2} M \alpha' r$

$= \frac{1}{2} M a$

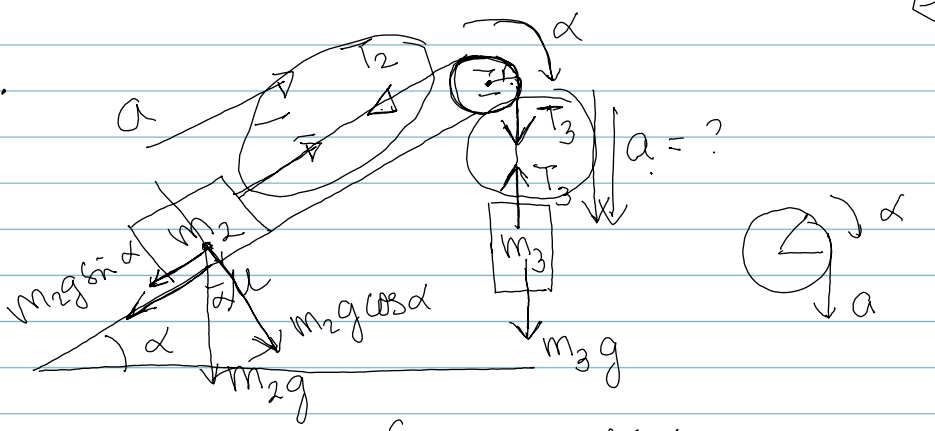
$Mg - Ma - \frac{2}{5} Ma = \frac{1}{2} Ma$

$a = \frac{Mg}{M + \frac{2}{5} M + \frac{1}{2} M} = \frac{g}{1 + \frac{2}{5} + \frac{1}{2}} = \frac{10}{19} g$

$\boxed{a = \frac{10}{19} g}$!!

E

4.



$\tan\alpha = \frac{3}{4}$ $\qquad f = \mu m_2 g \cos\alpha$

$m_3 a = m_3 g - T_3 \Rightarrow \boxed{T_3 = m_3 g - m_3 a}$

$$a = \frac{T_2 - m_2 g \sin\alpha - \mu m_2 g \cos\alpha}{m_2}$$

$$\boxed{T_2 = m_2 a + m_2 g \sin\alpha + \mu m_2 g \cos\alpha}$$

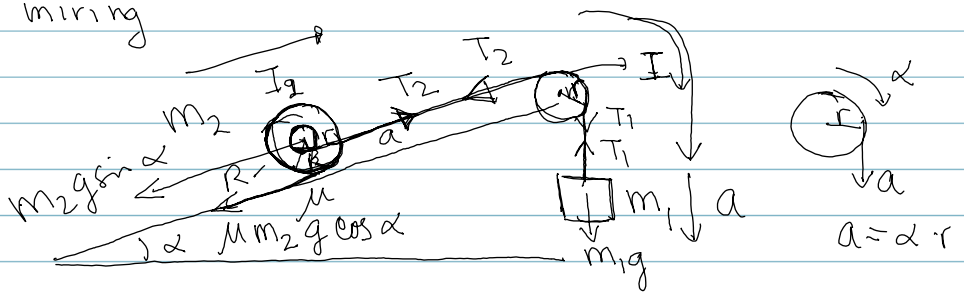
$$\alpha = \frac{T_3 \cdot r - T_2 r}{I}$$

$$\frac{aI}{r^2} = (T_3 - T_2)$$

$$\frac{aI}{r^2} = m_3 g - m_3 a - m_2 a - m_2 g \sin\alpha - \mu m_2 g \cos\alpha$$

$$\boxed{a = \frac{m_3 g - m_2 g \sin\alpha - \mu m_2 g \cos\alpha}{m_2 + m_3 + \frac{I}{r^2}}} \quad !!$$

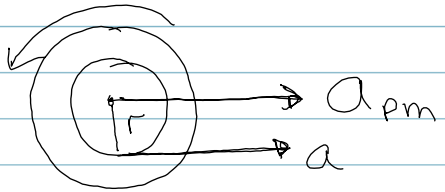
5. Sebuah ~~bola~~ cakram diletakkan diatas bidang miring



$$a = \frac{m_1 g - T_1}{m_1} \Rightarrow \boxed{T_1 = m_1 g - m_1 a} \quad 1$$

$$\alpha = \frac{T_1 r - T_2 r}{I} \Rightarrow \boxed{T_1 - T_2 = I\frac{\alpha}{r} = I\frac{a}{r^2}} \quad 2$$

$$a_{pm} = \frac{T_2 - m_2 g \sin\alpha - \mu m_2 g \cos\alpha}{m_2} \quad 3$$



$$a = a_{pm} + \alpha' r. \quad 4$$

$$\alpha' = \frac{T_2 r - \mu m_2 g \cos\alpha\, r}{I.} \quad 5$$

$$a =$$