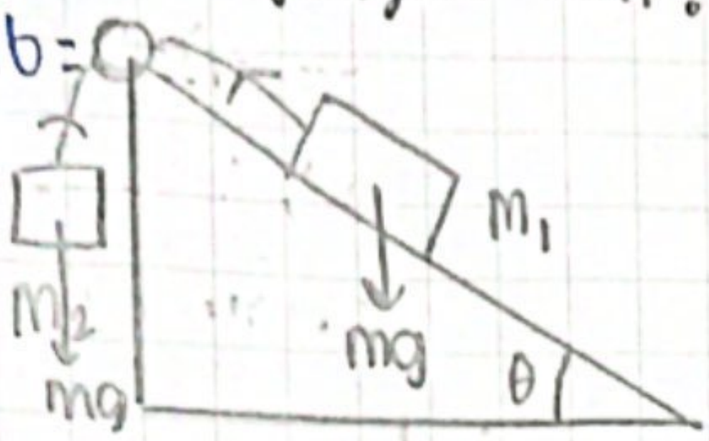
PR PERTEMUAN KE-6

17/10/2024

① Sebuah balok dengan:
$m_1 = 3,7$ kg
terletak pada bidang miring ($\theta = 30°$) yang licin.
Balok dihubungkan dengan balok lain
$m_2 = 2,3$ kg

Tentukan:
(a) percepatan masing-masing balok!
(b) Besar tegangan tali!

Jawab:



(a) $F_{balok1} = m_1 . a$
$m . g \sin\theta - T = m_1 . a$

(b) $F_{balok2} = m . a$
$T - m_2 . g = m_2 a$

$\therefore m . g \sin\theta - T = m_1 . a$
$T - m_2 . g = m_2 . a$

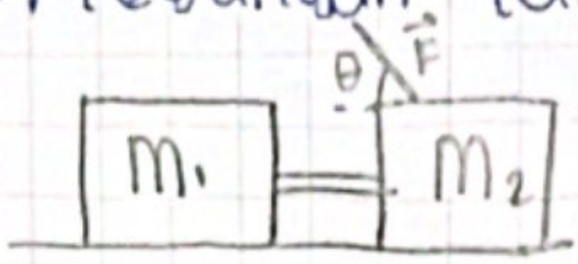
$m_1 . g \sin\theta - m_2 g = (m_1 + m_2) . a$
$3,7 \times 9,8 \times \sin 30° - 2,3 \times 9,8 = (3,7 + 2,3) a$
$18,13 - 22,54 = 6a$
$a = \frac{-4,41}{6} = -0,735 \ m/s^2$

(b) $F_{balok2} = m . a$
$T - m_2 . g = m_2 . a$
$T - 2,3 \times 9,8 = 2,3 \times 0,735$
$1,69 = T - 22,54$
$T = 24,23$ N

② Dik: $m_1 = 2$ kg
$m_2 = 1$ kg
$F = 20$ N
$\theta = 35°$
$\mu_k = 0,2$

Dit: a) percepatan balok!
b) tegangan tali!

Jawab:



↳ $F = \mu_k . m_1 . g$
$m . a = T - F_1$
$m_1 . a = T - \mu_k . m_1 . g$
$m_1 . a = T - (0,2 . 2 . 9,8)$
$m_1 . a = T - 3,92$ N (1)

Balok 2 =
$m_2 . a = F_u - T - f_2$
$m_2 . a = F \cos\theta - T - \mu_k . (m_2 . g - F \sin\theta)$
$m_2 . a = 20 \cos 35° - T - 0,2 (1 . 9,8 - 20 \sin 35)$
$m_2 . a = 16,38 - T - 0,2 (9,8 - 11,47)$
$m_2 . a = 16,38 - T - 0,2 (-1,67)$
$m_2 . a = 16,38 - T + 0,334$ (2)

$m_1 . a = T - 3,92$
$m_2 . a = 16,38 - T + 0,334$ +
$(m_1 + m_2) a = 16,38 - 3,92 + 0,334$
$3a = 12,794$
$a = \frac{12,794}{3} = 4,26 \ m/s^2$

(17) $m.a = T - 3,92$

$2 \times 4,26 = T - 3,92$

$8,52 = T - 3,92$

$T = -3,92 - 8,52$

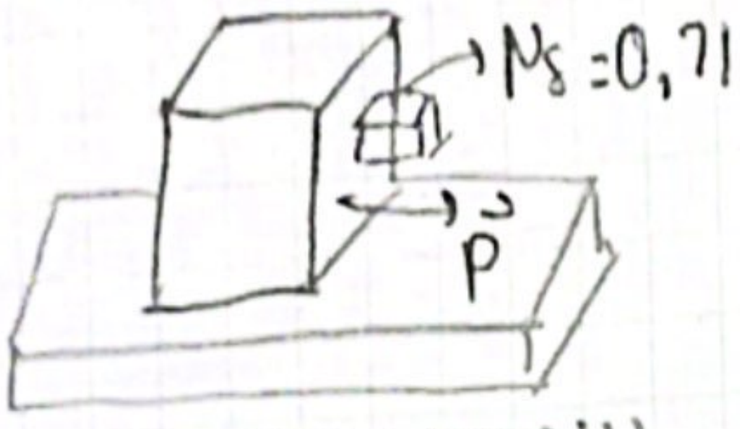
$= 12,44\,N$ //

③ Dik : $m_1 = 25\,kg$

$m_2 = 4\,kg$

$N_s = 0,71$

Dit : nilai min. gaya $\vec{P}$ yang dibutuhkan agar kubus tdk geser ke bawah?



Jawab : Kubus 1 (kiri) :

$W = m.g = 4.9,8$

$= 39,2\,N$

$F_{s\,max} = N_s.N$

$N = m.a$

$a = \frac{P}{N}$

$N_s.N = W$

$N_s.m.a = W$

$\Leftrightarrow a = \frac{P}{m}$ & $W = 392,N$:

$N_s.m.\frac{P}{m} = 39,2$

$0,71.4.\frac{P}{25} = 39,2$

$2,84.\frac{P}{25} = 39,2$

$\frac{P}{25} = \frac{39,2}{2,84}$

$P = \frac{39,2 \times 25}{2,84}$

$= 344,37\,N$ //

=D