

CONCURSUL INTERJUDEȚEAN DE FIZICĂ "CYGNUS"
SUCEAVA
23 martie, 2019

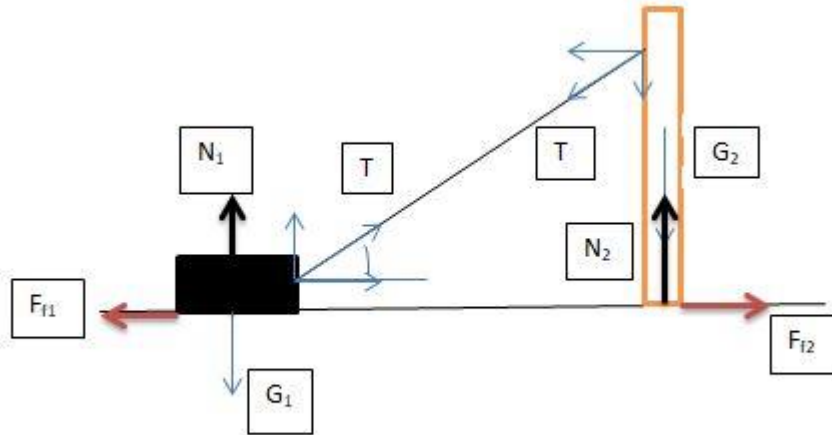
Clasa a IX-a, PROBLEMA 1

Barem de notare	Parțial	Punctaj
Problema 1		10 p
a)	3 p	
$h = \frac{vt}{\operatorname{tg}\alpha_1 - \operatorname{tg}\alpha_2}.$		
b)	3 p	
$v'_m = \frac{1}{2}\sqrt{v_1^2 + v_2^2 + 2v_1v_2 \cos\theta}; \cos\beta' = \frac{v_1 + v_2 \cos\theta}{\sqrt{v_1^2 + v_2^2 + 2v_1v_2 \cos\theta}}.$ $v''_m = \frac{v_1v_2}{v_1 + v_2}\sqrt{2(1 + \cos\theta)}; \cos\beta'' = \sqrt{\frac{1 + \cos\theta}{2}}.$		
c)	3 p	
$(\vec{r}_{01} - \vec{r}_{02}) // \vec{v}_{2,1}$		
Oficiu	1 p	

Clasa a IX-a, PROBLEMA 2

Barem de notare	Parțial	Punctaj
Problema 2		10 p
a)	3 p	
$F_f = \frac{m_1 m_2 v_0^2 \cos^2 \alpha}{l(m_1 + m_2)}.$		
b)	3 p	
$d_2 = \frac{a_2 t_0^2}{2} = \frac{1}{2} \frac{m_1 l}{m_1 + m_2}; d_1 = d_2 + \frac{l}{2}.$ $v_2 = a_2 t_0 = \frac{m_1 v_0 \cos \alpha}{m_1 + m_2} = V_0.$		
c)	3 p	
$V = \sqrt{V_0^2 - \frac{\mu g x^2}{l}}; X = V_0 \sqrt{\frac{l}{\mu g}}.$		
Oficiu	1 p	

Problema 3



Problema 3	Rezolvare	Punctaj
	Pentru desen	3
	Pentru ca sania si omul sa inceapa sa se miste trbuie invinse fortele de frecare statice (la echilibru egale) si in acest caz vom avea pentru sania si om ecuatiile: $T \cos \alpha - \mu_1 (m_1 g - T \sin \alpha) = 0$ $T \cos \alpha - \mu_2 (m_2 g + T \sin \alpha) = 0$	3
	$T (\cos \alpha + \mu_1 \sin \alpha) = \mu_1 m_1 g$ $T (\cos \alpha - \mu_2 \sin \alpha) = \mu_2 m_2 g$ $\operatorname{tg} \alpha = (\mu_1 m_1 - \mu_2 m_2) / \mu_1 \mu_2 (m_1 + m_2)$	3
	oficiu	1