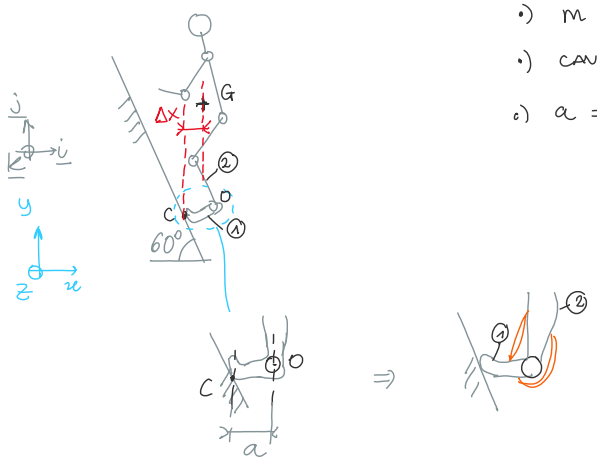
Esercizio compito di esame - attrito - scalatore

giovedì 14 novembre 2024 17:23

Piano sagittale 2D

Testo:

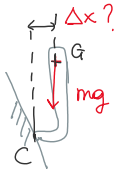
- unico punto di appoggio in "C"
- $m = 70\ kg$
- CAVIGLIA = CERNIERA ⇒ FLESSO-ESTEN – ASSE per O
- $a = 20\ cm$



Richiesto:

1) Valutare la posizione di G, Δx per avere EQ. STATICO
2) Valutare f_{A_MIN} in C
3) Reazioni articolari caviglia
   ⇓
   REAZ. VINCOLARI cerniera
   – Coppia articolare ⇒ generata dai muscoli

1) Isoliamo l'atleta ⇒ 1 CORPO RIGIDO

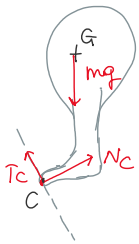


- AFV: Appoggio con attrito aderenza ⇒ (2) INCOG.

$|T_C| \leq f_A |N_C|$

⇒ INCOGNITA Δx ⇒ (1)

INC. (2)+(1) = 3 ⟷ 3 EQ^NI



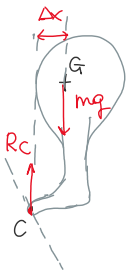
⇒ CORPO SOGGETTO A 2 FORZE ⇒ $\underline{R_C} + m\underline{g} = \underline{0}$

↓

COPPIA A BRACCIO NULLO

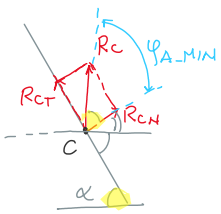
$\underline{R_C} = -m\underline{g}$

↳



- $R_C \parallel mg$
- Eq rota ⇒ $\Delta x = 0$

2) f_{A_MIN}



$|R_{CT}| = f_{A\_MIN} |R_{CN}|$

↓

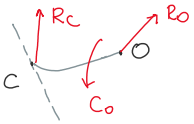
$tg(\varphi_{A\_MIN})$

⇒ $\varphi_{A\_MIN} = \alpha = 60°$ ⇒ $tg(\varphi_{A\_MIN}) = 1{,}73$

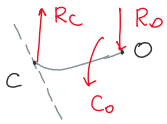
3) DCL

AFV: C ⇒ $\underline{R_C} = -m\underline{g}$

O ⇒ (R_{Ox}, R_{Oy}) ⇒ (2) INCOG.



INC. ATTIVA $\Rightarrow$ $C_O = \dfrac{① \text{ INC}}{3 \text{ INC} + 3 \text{ ER}}$ ok!



$\underline{R_O} + \underline{R_C} = \underline{0}$

$\underline{R_O} = -\underline{R_C} = \underline{mg}$

$\circlearrowleft$ $C_O = R_C \, a$ $\Rightarrow$ $C_O = 137{,}34$ Nm · COPPIA ARTIC.

$R_O = 686{,}7$ N REAZ. ARTIC.

DCL DEF