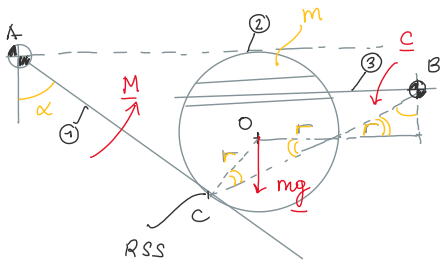
Eserc. Compito esame - RSS

giovedì 14 novembre 2024 17:49



Noto: $\alpha = 60°$, r, massa del ② + disco $0 \, mg$. $O \equiv G_2$, $\underline{C}$ su ③ noto

Richiesto: 1) AFV, SCI, SEI

2) $\underline{M}$ per avere l'ep. statico $\Rightarrow$ PSE

DCL DEF $\rightarrow$ mg, $\underline{M}$; $\underline{C}$, $\underline{M}$

3) valuta f_{AMIN} per RSS

$\alpha = 60°$

$\gamma = 30°$

1) AGV: $ngdl = 3 \times 3 - 2 \times 2 - 1 \times 2 - 2 = 1$ (CER, CP, RSS)

AFV: ○ A, B $\Rightarrow$ $R_{Ax}, R_{Ay}, R_{Bx}, R_{By}$ } 4 INC.

$\Rightarrow$ $R_{CP} \parallel \underline{j}$, M_{CP} $\Rightarrow$ 2 INC

$\Rightarrow$ $|T_C| \leq f_A |N_C|$ = 2 INC

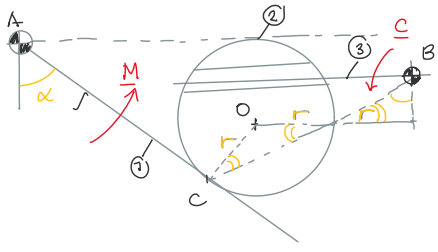
REAZ. VINC. 8 INC.
+
1 AZIONE ATTIVA +1
M
9 INC VS 9 EQ

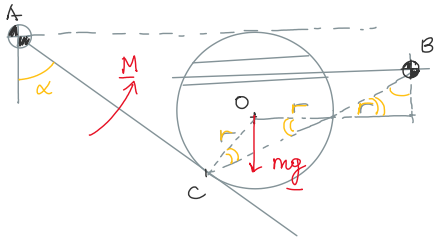
$\Rightarrow$ SCI (SÌ)

$\Rightarrow$ SEI (NO)

$\Rightarrow$ CORPI SCARICHI ? NO — ma SÌ per PSE

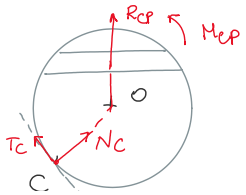
CASO I - $\underline{C}$, $\underline{M}$ $\rightarrow M'$ (+) CASO II - mg, $\underline{M}$ $\rightarrow M''$ $\Rightarrow M = M' + M''$

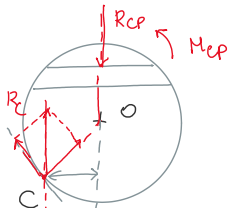


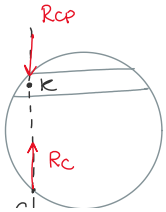


CASO I $\Rightarrow$ ② è SCARICO

DCL - PREL ②







$\underline{R}_{CP} + \underline{R}_C = 0$

$\underline{R}_{CP} = -\underline{R}_C$

$\underline{R}_{CP} \nparallel \underline{j}$

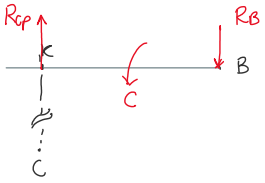
$C\curvearrowleft \; -R_{CP}\,(b_{CP}) + M_{CP} = 0$

CALCOLARE

↳ AC. della coppia

⇓

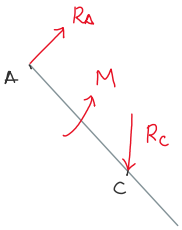
|| 1 INCOGNITA $R_C = R_{CP}$ ||

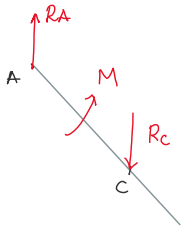


$B\curvearrowleft \quad C - R_{CP}\,\overline{BK} = 0$

$R_{CP} = \frac{2}{5}\frac{C}{r} = R_B = R_C$

①

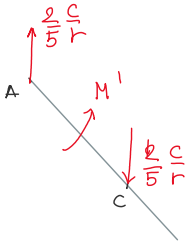


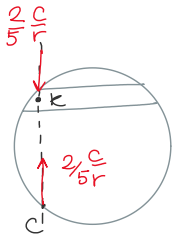


$A\curvearrowleft \quad M - R_C\,\overline{AC}_x = 0$

$M = \frac{\sqrt{3}}{5}(2+\sqrt{3})\,C = M'$

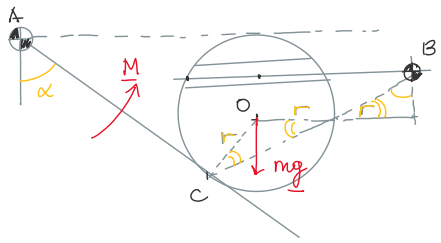
DCL. - DEF. CASO I





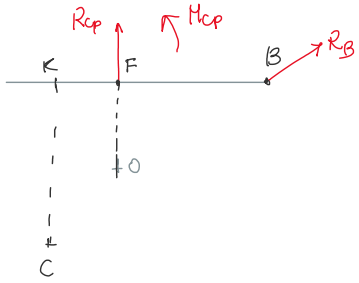
CASO II – $\underline{mg}$, $\underline{M}$ ⇒ CORPO 3 SCARICO

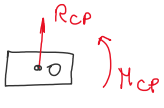
M'



Ⓐ

$(F, \underline{R}_{CP})$

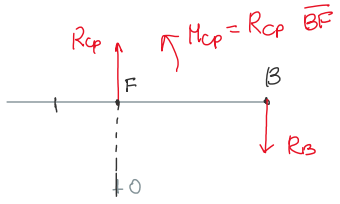




ICS) $\underline{R}_{CP} + \underline{R}_B = 0$

$\underline{R}_{CP} = -\underline{R}_B$

IICS) $B\curvearrowleft \; -R_{CP}\,\overline{BF} + M_{CP} = 0$

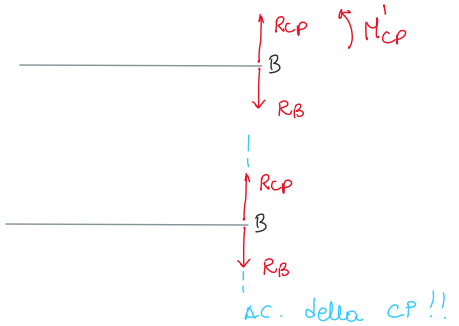


$M_{CP} = R_{CP}\ \overline{BF}$

$\Rightarrow$ 1 INC. $\Rightarrow$ R_{CP}

(B)

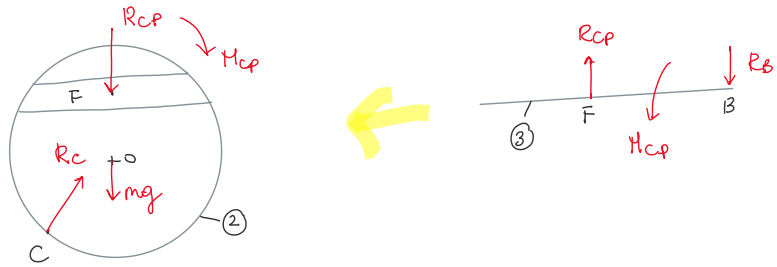
$(B, \underline{R}_{CP})$



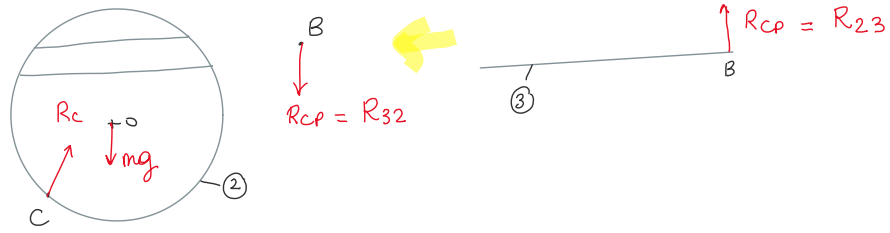
$B\ \curvearrowleft \quad M'_{CP} = 0$

$\Rightarrow$ 1 INCOGNITA

(A)



(B)

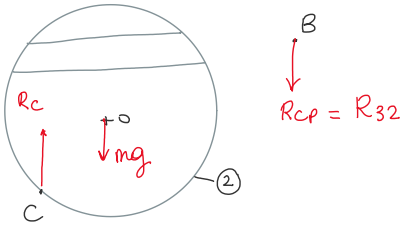


I CS) $\underline{R}_{CP} + \underline{mg} + \underline{R}_C = \underline{0}$

x: $R_{Cx} = 0 \Rightarrow R_C = R_{Cy}$

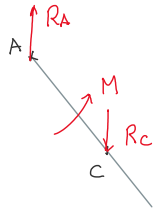
y: $R_{Cy} - mg - R_{CP} = 0$

$\quad \| \quad R_C$



II CS) $B\ \curvearrowleft \quad -R_C\ \overline{BC}_x + mg\ \overline{BO}_x = 0$

$$\begin{cases} R_C = mg\,\dfrac{\overline{BO}_x}{\overline{BC}_x} = \dfrac{4}{5}\,mg \\ R_{CP} = \dfrac{mg}{5} \end{cases}$$

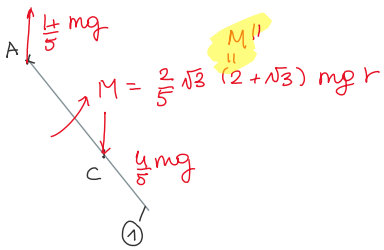


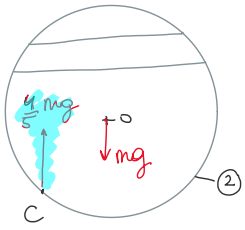
$\underline{R}_A = -\underline{R}_C = \dfrac{4}{5}\,mg\,\underline{j}$

$A\ \curvearrowleft \quad M - R_C\ \overline{AC}_x = 0$

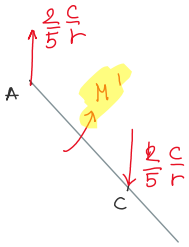
$M = M'' = \dfrac{2}{5}\sqrt{3}\,(2+\sqrt{3})\,mgr$

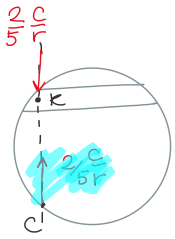
DCL. DEF. II CASO



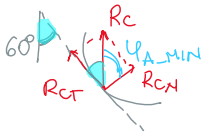


DCL. DEF. CASO I





) f_{A_min}



$$\underline{R_C} = \underline{R_C'} + \underline{R_C''} = \left(\frac{2}{5}\frac{C}{r} + \frac{4}{5}mg\right)\underline{j}$$

1) OSS. GEOM. $\quad \varphi_{A\,MIN} = 30°$

2) $R_{CT} = f_{A\_MIN}\, R_{CN}$

$\Big\} \; f_{A\_MIN} = 0.58$