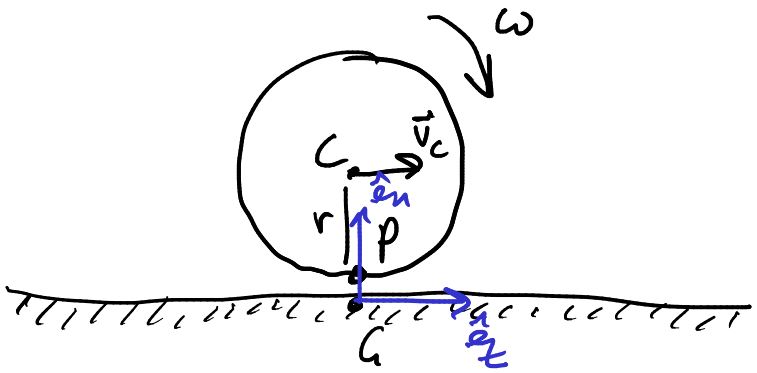
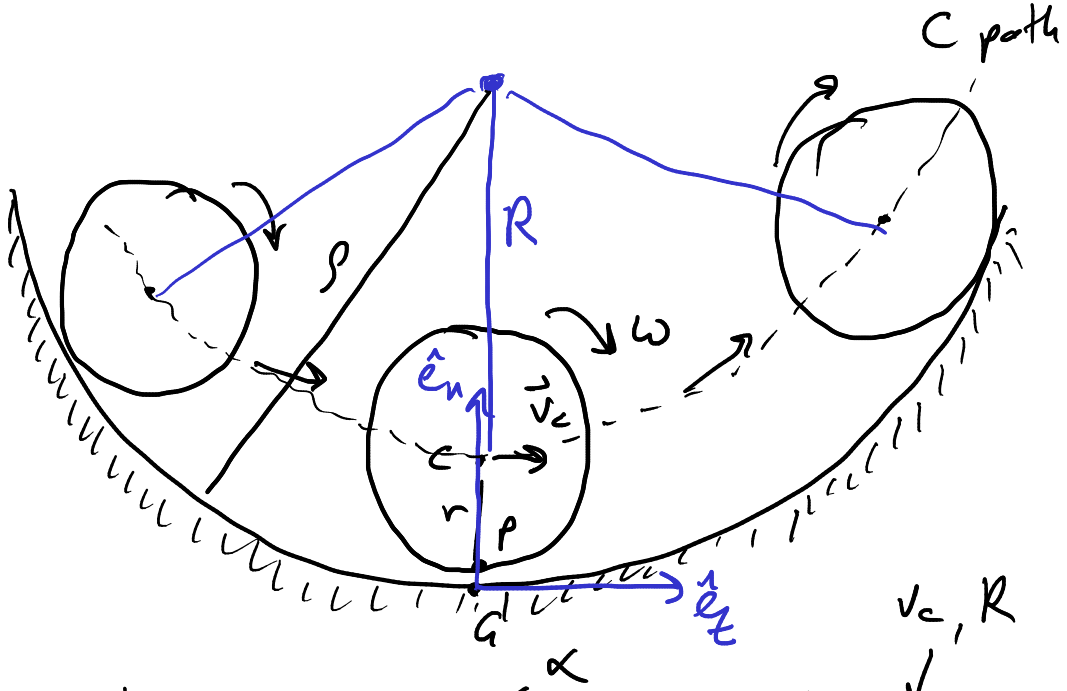
Rolling (without slipping)



$v_c = r\omega$ $\quad \vec{v}_c = r\omega\hat{e}_t$

$a_c = r\alpha$ $\quad \vec{a}_c = r\alpha\hat{e}_t$

Rolling on curved surface



$\vec{a}_c$ should have tang. and normal comp.

v_c, R

inst. center of wheel?

A: P ✓

B: G ✓

C: C

D: other

$\vec{v}_c = \vec{v}_P^{\,0} + \vec{\omega} \times \vec{r}_{PC}$

$= r\omega\hat{e}_t$

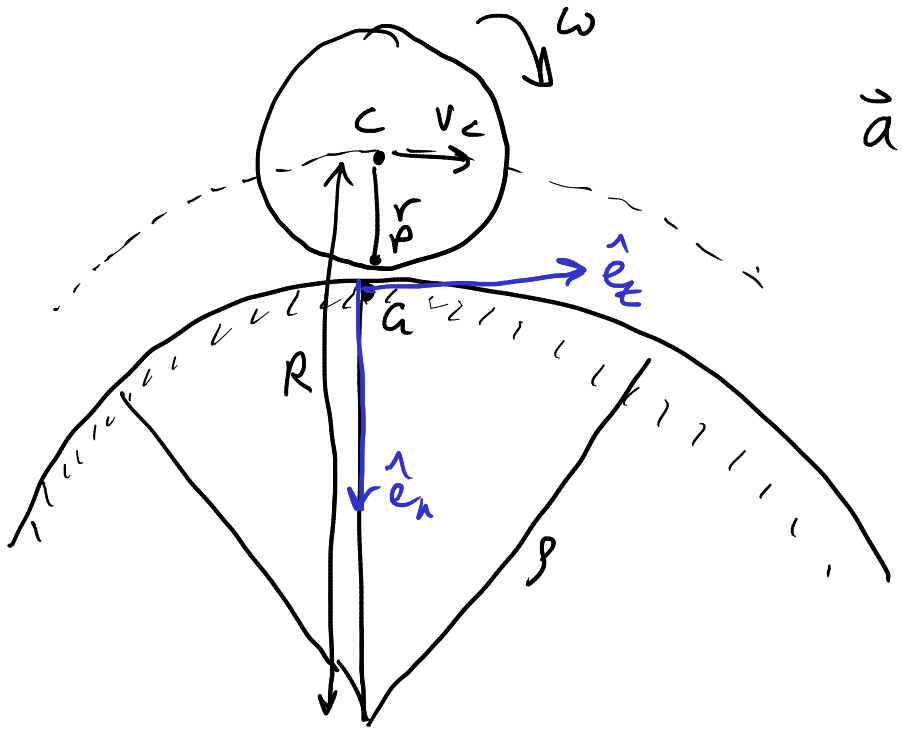
same as flat.

ρ = rad. curve ground

R = rad. curve. C

$$\vec{a}_c = r\alpha\,\hat{e}_t + \frac{v_c^2}{R}\,\hat{e}_n$$

$$\rho = R + r$$



$$\vec{a}_c = r\alpha\,\hat{e}_t + \frac{v_c^2}{R}\,\hat{e}_n$$

$$R = \rho + r$$