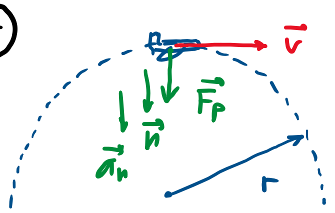
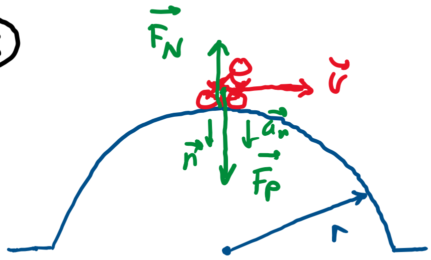
5.27



On choisit, pour simplifier, le sommet de la trajectoire. L'apesanteur apparente est atteinte si $\vec F_p$ est la seule force qui agit sur les passagers.

$$\sum \vec F = \vec F_p = m\vec a_n \Rightarrow \text{sur } \vec n : \; F_p = m\frac{v^2}{r} \Rightarrow r = \frac{\cancel{m} v^2}{\cancel{m} g} = \frac{(770/3{,}6)^2}{9{,}81} = \underline{\underline{4{,}66\cdot 10^3 \text{ m}}}$$

5.28



(a). $\Sigma \vec F = \vec F_N + \vec F_p = m\vec a_n$

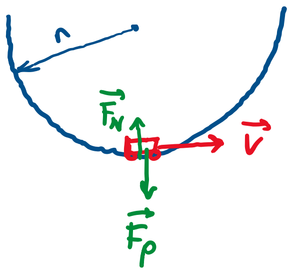
Sur $\vec n$: $\underbrace{-F_N + F_p}_{=\text{ résultante normale des forces}} = m a_n$

$$\Rightarrow m a_n = m\frac{v^2}{r} = 324\cdot\frac{25^2}{126} = \underline{\underline{1{,}61\cdot 10^3 \text{ N}}}$$

(b). $F_N = F_p - m a_n = mg - m a_n = 324\cdot 9{,}81 - 1{,}61\cdot 10^3 = \underline{\underline{1{,}57\cdot 10^3 \text{ N}}}$

⇒ Le motard se sent un peu plus "léger" !

5.29



$\Sigma \vec F = \vec F_N + \vec F_p = m\vec a_n$

Sur $\vec n$: $F_N - F_p = m a_n = m\frac{v^2}{r}$

poids apparent $= F_N = 2F_p$

$$\Rightarrow 2F_p - F_p = F_p = m\frac{v^2}{r}$$

$$\Rightarrow v = \sqrt{\frac{rF_p}{m}} = (rg)^{1/2} = (20\cdot 9{,}81)^{1/2} = \underline{\underline{14 \text{ m/s}}}$$