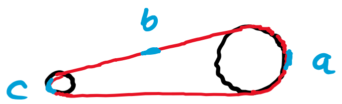
5.1



(a). En a : $a_n = \frac{v^2}{r} = \frac{1,4^2}{0,1} = 19,6 \ m/s^2$

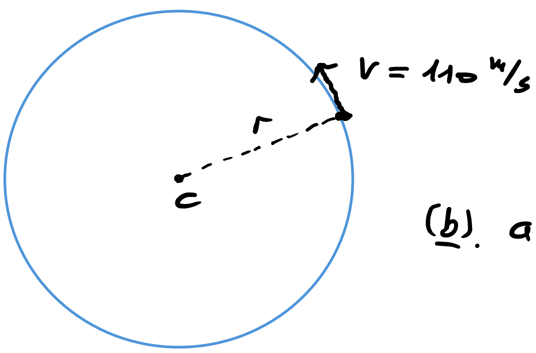
(b). En b, $a_n = 0 \ m/s^2$ (mouvement rectiligne)

(c). En c, $a_n = \frac{v^2}{r} = \frac{1,4^2}{0,039} \cong 50 \ m/s^2$

5.2

$$a_n = \frac{v_A^2}{r_A} = \frac{v_B^2}{r_B} \Rightarrow \frac{v_A^2}{v_B^2} = \left(\frac{v_A}{v_B}\right)^2 = \frac{r_A}{r_B} = 4,0$$

5.3

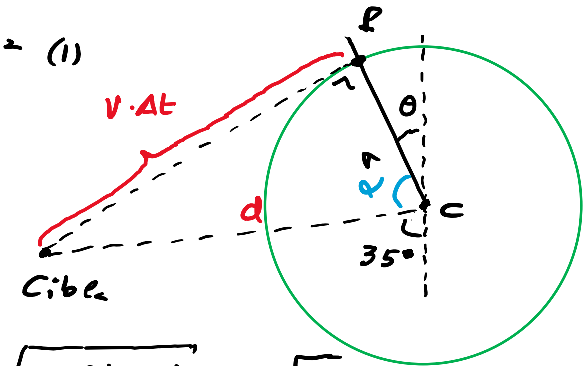


(a). $T = \frac{2\pi r}{v} = \frac{2\pi \cdot 2850}{110} = 163 s$

(b). $a_n = \frac{v^2}{r} = \frac{110^2}{2850} = 4,25 \ m/s^2$

5.4

La trajectoire du projectile est tangente au cercle au point de lâcher P.



- Pythagore : $d^2 = r^2 + v^2\Delta t^2$ (1)
- Trigo : $\sin\alpha = \frac{v \cdot \Delta t}{d}$ (2)
- $d = 10r$ (3)

$\alpha = 180 - \theta - 35°$

$\Rightarrow \sin\alpha = \sin(\theta + 35)$

De (1) : $v\Delta t = \sqrt{d^2 - r^2} = \sqrt{100r^2 - r^2} = r\sqrt{99}$

Dans (2) : $\sin\alpha = \frac{\cancel{r}\sqrt{99}}{10\cancel{r}} = \frac{\sqrt{99}}{10} \Rightarrow \alpha = \arcsin\left(\frac{\sqrt{99}}{10}\right) = 180 - 35 - \theta$

$\Rightarrow \theta = -\arcsin\left(\frac{\sqrt{99}}{10}\right) + 145 \cong 60,7°$