

Etwinning: berekeningen Typhoon

Geg.:

$$\begin{aligned}h &= 25,7 \text{ m} \\ l &= 670 \text{ m} \\ v &= 80 \text{ km/h} = 22,2 \text{ m/s} \\ t &= 1,30 \text{ min} = 80 \text{ s}\end{aligned}$$

$$\begin{aligned}\alpha &= 97^\circ \\ r &= 19 \text{ m (looping)} \\ m &= 50 \text{ kg}\end{aligned}$$

Gevr.:

a) F_g ?	d) E_{kin} ?
b) $F_{centripetaal}$?	e) a_x ?
c) E_{pot} ?	f) F ?

Opl.:

$$a) F_g = m \cdot g = 1 \cdot 9,81 = 9,81 \text{ N/kg}$$

$$b) F_c = \frac{m \cdot v^2}{r} = \frac{1 \cdot (22,2)^2}{19} = 25,9 \text{ N/kg}$$

$$c) E_{pot} = m \cdot g \cdot h = 1 \cdot 9,81 \cdot 25,7 = 252 \text{ J/kg}$$

$$d) E_{kin} = \frac{m \cdot v^2}{2} = \frac{1 \cdot (22,2)^2}{2} = 247 \text{ J/kg}$$

c en d \Rightarrow 1) Verlies: $252 \text{ J/kg} - 247 \text{ J/kg} = 5 \text{ J/kg}$
 \Rightarrow Het verlies is verwaarloosbaar.

$$2) E_{mech} = E_{pot} + E_{kin} = 499 \text{ J/kg}$$

$$e) a_x = \frac{\Delta v}{\Delta t} = \frac{22,2}{80} = 0,28 \text{ m/s}^2$$

$$f) F = m \cdot a = 50 \cdot 0,28 = 14 \text{ N}$$