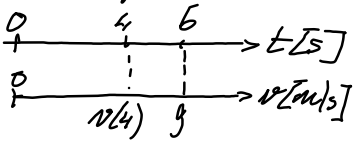
⑨ Geg fietser in 6[s] van 0 → 9[m/s]

Vraag $v(4)$ op bovenkant wiel

Oplossing

Ref. model



Rek. model

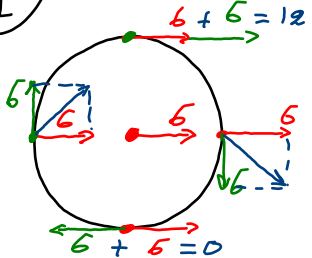
$v_e = v_0 + at$

$9 = 0 + a \cdot 6 \Rightarrow a = \frac{9}{6}\,[m/s^2]$

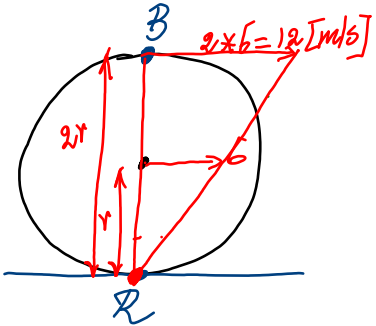
$v(4) = 0 + \frac{9}{6} \cdot 4 \Rightarrow v(4) = 6\,[m/s]$

v_{fiets}

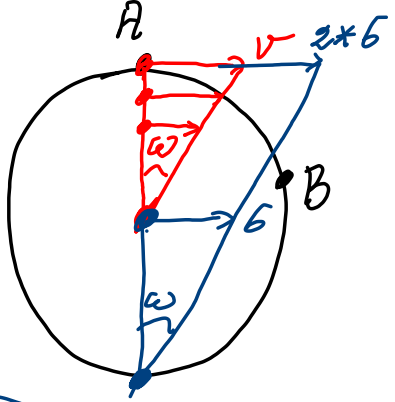
I



II



Punt B roteert ook om R.



$v = \omega * r$

hoek snelh. straal

$[rad/s] * [m] = [m/s]$

Kracht moment

↓ kracht * arm

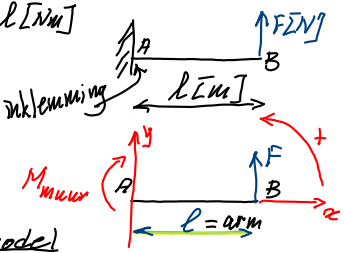
$M = F * l \; [Nm]$

↓

z

↑

tang

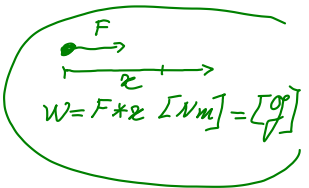


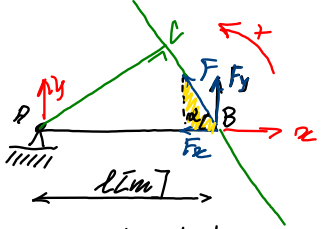
Rek. model

$\Sigma M_A \; (+) = 0$

$-M_{inklem} + F * l = 0$

$M_{inklem} = F * l \; [Nm]$





Vraag Hoe groot is het moment van F

Fx levert geen moment tov. A, omdat de arm = 0

① $\Sigma M_A = F_y * l$

$= F \cdot \sin\alpha * l.$

② M = kracht * arm.

arm: "kortste afstand tot draaipunt"

$\Sigma M_A = F * arm$

$= F * l \cdot \sin\alpha$

$\equiv$

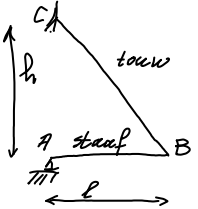
Geg

$l = 4[m]$

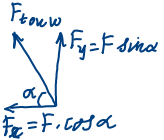
$h = 3[m]$

$m = 80[kg]$ staaf

$g = 10[m/s^2]$

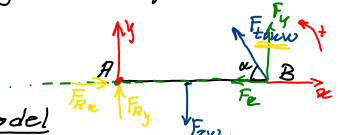


Vraag Bereken F_{touw}



Oplossing

Ref. model



Rek. model

$\Sigma M_A \overset{+}{\circlearrowleft} = 0$

$-F_{zw_{st}} * \frac{1}{2}l + F_y * l = 0$

$-80 * 10 * \frac{1}{2} \cdot 4 + F_y * 4 = 0 \Rightarrow F_y = 400[N]$

$F_{zw_{st}} = m * g$

$F_y = F_{touw} \cdot \sin(\alpha)$

$400 = F_{touw} \cdot \frac{3}{5}$

$\Rightarrow F_{touw} = 400 * \frac{5}{3} \approx 670[N]$

Intermezzo

$\Sigma F \overset{+}{\uparrow} = 0$

$-F_{zw} + F_y + F_{Ry} = 0$

$-800 + 400 + F_{Ry} = 0$

$F_{Ry} = 400[N]$

$\Sigma F \overset{+}{\rightarrow} = 0$

$-F_x + F_{Rx} = 0$