$s = s_1 + s_2$

* $s_1 = v \cdot t = 10{,}0 \cdot 10{,}0 = 100\ m$
* $s_2 = v_0 t - \frac{1}{2} a t^2 = 10{,}0 \cdot 2{,}0 - \frac{1}{2} a \cdot 2{,}0^2$
  * a: 1) $F_r = ma = 100 \cdot a$
    2) $F_r = F_{rem} = 400\ N$
    $\Rightarrow a = 4{,}00\ m/s^2$

$\Rightarrow s_2 = 12\ m$

$\Rightarrow s = 112\ m$

1) $F_r = ma = 14 \cdot a$

* a: $\Delta v = a\Delta t$
  * $\Delta v = 1{,}5\ m/s$
  * $\Delta t = 2{,}5\ s$
  * $\Rightarrow a = 0{,}60\ m/s^2$

$\Rightarrow F_r = 8{,}4\ N$

2) $F_r = F_x - F_w$

* $F_w = 60\ N$
* $F_x = F \cos 40$

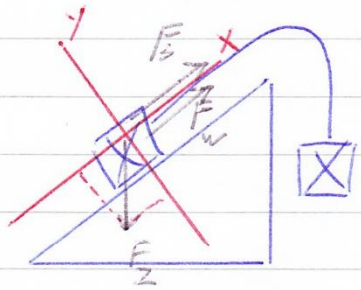
$\Rightarrow F_r = F \cos 40 - 60$

$\Rightarrow 8{,}4 = F \cos 40 - 60$

$\Rightarrow F = 89\ N$

Krachten Kist op helling 3.docx

A)



1) $F_T = ma = 5{,}0 \cdot a$

2) $F_T = F_{Z,x} - F_W - F_S$

- $F_S = 10\ N$
- $F_{Z,x} = F_Z \sin 30$
  - $F_Z = mg = 5{,}0 \cdot 9{,}81 = 49{,}05\ N$

$\Rightarrow F_{Z,x} = 24{,}53\ N$

- $F_W = f F_N = 0{,}10 \cdot F_N$
  - F_N: 1) $F_T = 0$

2) $F_T = F_N - F_{Z,y}$

- $F_{Z,y} = F_Z \cos 30$

$\Rightarrow F_T = F_N - 42{,}48$

$\Rightarrow F_N = 42{,}48\ N$

$\Rightarrow F_W = 8{,}50\ N$

$\Rightarrow F_T = 6{,}03\ N$

$\Rightarrow a = 1{,}206\ m/s^2$

$v = a \cdot t$

- $a = 1{,}206\ m/s^2$
- t: $s = \frac{1}{2} a t^2$
  - $s = 5{,}0\ m$
  - $a = 1{,}206\ m/s^2$

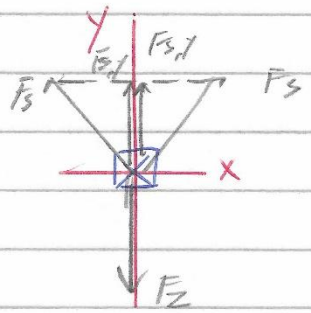
$\Rightarrow t = 2{,}88\ s$

$\Rightarrow v = 3{,}5\ m/s$

B) Volgens de 3e wet van Newton geldt $|F_g| = |F_N|$

$\Rightarrow F_g = F_N = 42\ N$

A)



i) $F_r = 0$

ii) $F_r = 2F_{s,y} - F_z$

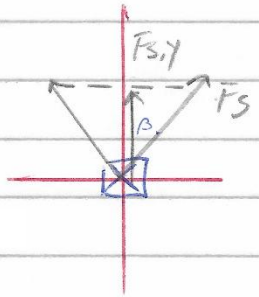
* $F_z = mg = 95 \cdot 10^{-6} \cdot 9,81 = 9,3195 \cdot 10^{-4}\ N$
* $F_{s,y} : \cos 55 = \frac{F_{s,y}}{F_s}$

$\Rightarrow F_{s,y} = F_s \cdot \cos 55$

$\Rightarrow F_r = 2 \cdot F_s \cdot \cos 55 - 9,3195 \cdot 10^{-4}$

$\Rightarrow F_s = 8,124 \cdot 10^{-4} = 8,1 \cdot 10^{-4}\ N$

B)



$\alpha = 2 \cdot \beta$

$\cos \beta = \frac{F_{s,y}}{F_s}$

* $F_{s,y} = \frac{1}{2} F_z = \frac{1}{2} \cdot mg = \frac{1}{2} \cdot 95 \cdot 10^{-6} \cdot 9,81$
$= 4,66 \cdot 10^{-4}\ N$
* $F_s = 8,7 \cdot 10^{-4}\ N$

$\Rightarrow \beta = 57,62°$

$\Rightarrow \alpha = 115°$

A) wagon 1 : 1) $F_T = ma$

2) $F_T = F_{S_1}$

$\Rightarrow F_{S_1} = ma$

wagon 2 : 1) $F_T = 2ma$

2) $F_T = F_{S_2} - F_S = F_{S_2} - ma$

$\Rightarrow F_{S_2} = 3ma$

wagon 3 : 1) $F_T = 3ma$

2) $F_T = F_{S_3} - F_{S_2} = F_{S_3} - 3ma$

$\Rightarrow F_{S_3} = 6ma$

$6ma = 6{,}0 \cdot 10^3\ N \Rightarrow ma = 1{,}0 \cdot 10^3\ N$ ✓

dus $F_{S_1} = 1{,}0 \cdot 10^3$; $F_{S_2} = 3{,}0 \cdot 10^3\ N$ en $F_{S_3} = 6{,}0 \cdot 10^3\ N$ ✓

B) $F = 6{,}0 \cdot 10^3\ N$

met marge $\Rightarrow F = 8{,}0 \cdot 10^3\ N$ ✓

$50 \cdot 10^3\ N \triangleq 1\ cm^2 \Rightarrow 8{,}0 \cdot 10^3 \triangleq 0{,}16\ cm^2$

dus $A = 0{,}16\ cm^2$

$A = \frac{1}{4} \pi d^2 \Rightarrow d = 0{,}45\ cm$