

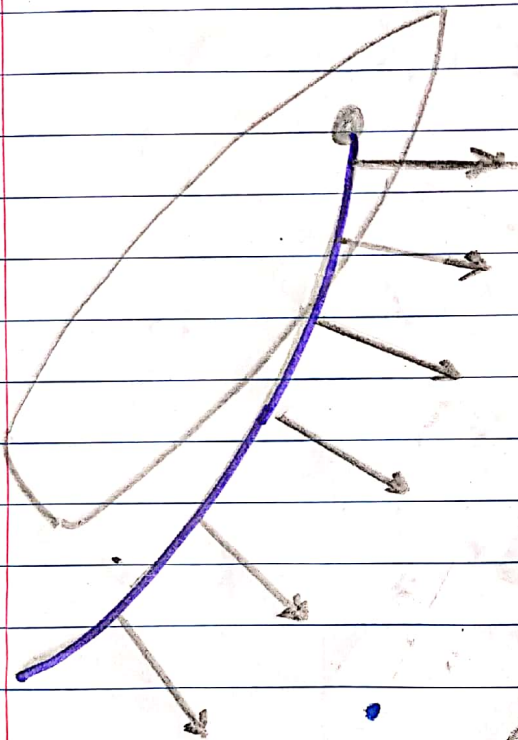
Newton 4^e drub.

Sport & Verkeer (II)

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$F_{w, \text{dwars}} \Rightarrow F_{w, \text{lengte}}$

a



$\Sigma F_{\text{op zeil}}$
is naar
voren gericht

b

De bolking van
het zeil is
noodzakelijke
om er voor te
zorgen dat de

$\Sigma F_{\text{naar voren}} > 0$ is.

c zie figuren

d langer voortste, toren zeil

Newton ws 4 Sport & Verkehr

70 $v = 20 \text{ km/h} \hat{=} 5,56 \text{ m/s}$
 $F_{\text{air}} = 15 \text{ N}$

$$m_{\text{lot}} = 90 \text{ kg}$$

helling 8% $\Rightarrow \text{inv sin}(0,08) = 4,59^\circ$
 $\alpha = \sqrt{4,59^\circ}$

$$a = 0$$

a $F_2 = m \cdot g$
 $= 90 \cdot 9,81$
 $= 8,82 \dots \cdot 10^2 \text{ N}$

b 8% $\hat{=} \alpha = 4,59^\circ$

$$F_{\text{omlaag}} = F_{\text{trap}} = F_2 \cdot \sin 4,59$$
$$= 700 \dots \cdot 10^1 \text{ N}$$
$$\approx 700 \text{ N}$$

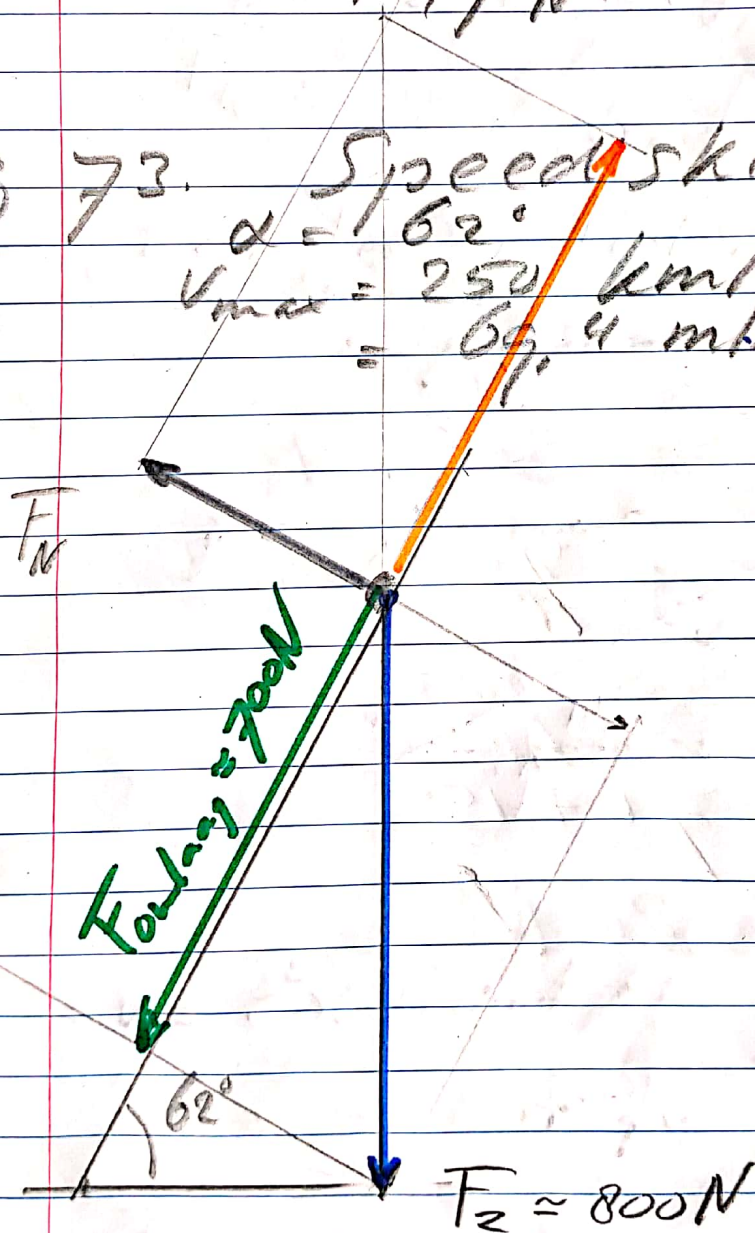
c $F_{\text{tot}} = 71 + 15$
 $= 86 \text{ N}$

Newton Hand 4
§4.4 pag 150

oppg 71 $m = 3,3 \text{ kg}$
 $\alpha = 25^\circ$

$$F_{\text{skriff}} = F_{\text{omlag}} = F_2 \cdot \sin \alpha$$
$$= 3,3 \times 9,81 \times \sin 25^\circ$$
$$= 13,7 \text{ N}$$

oppg 73. Speedskiën
 $\alpha = 62^\circ$
 $v_{\text{max}} = 250 \text{ km/h}$
 $= 69,4 \text{ m/s}$



73b

$$F_{\text{ur}} = \phi$$

$$F_{\text{omlaag}} = 700 \text{ N (op meter)}$$

$$\begin{aligned} F_{\text{omlaag}} &= F_2 \times \sin 62 \\ &= 800 \times 9,81 \times \sin 62 \\ &= 693 \text{ N} \approx 700 \text{ N} \\ (800 \cdot \sin 62) &= 700 \text{ N} \end{aligned}$$

b

$$F_{\text{ur}} = 0$$

$$F_{\text{omlaag}} = 700 \text{ N}$$

$$m = 80 \text{ kg} \quad \div$$

$$a = 8,75 \text{ m/s}^2$$

c. F_{wl} neemt (sterk) toe

$$d. F_{\text{wl}} = k \cdot v^2 \quad (F_{\text{gly}} = 0)$$

$$700 \text{ N} = k \cdot (69,4)^2$$

$$k = 0,145$$

e. 40% betere stroomlijn

$$k_{\text{5}} = \sqrt{1,40} = 1,18$$

$$250 / 1,18 = 211 \text{ km/h}$$

75

wielrenner

$\alpha = 10^\circ$

$m = 80 \text{ kg}$

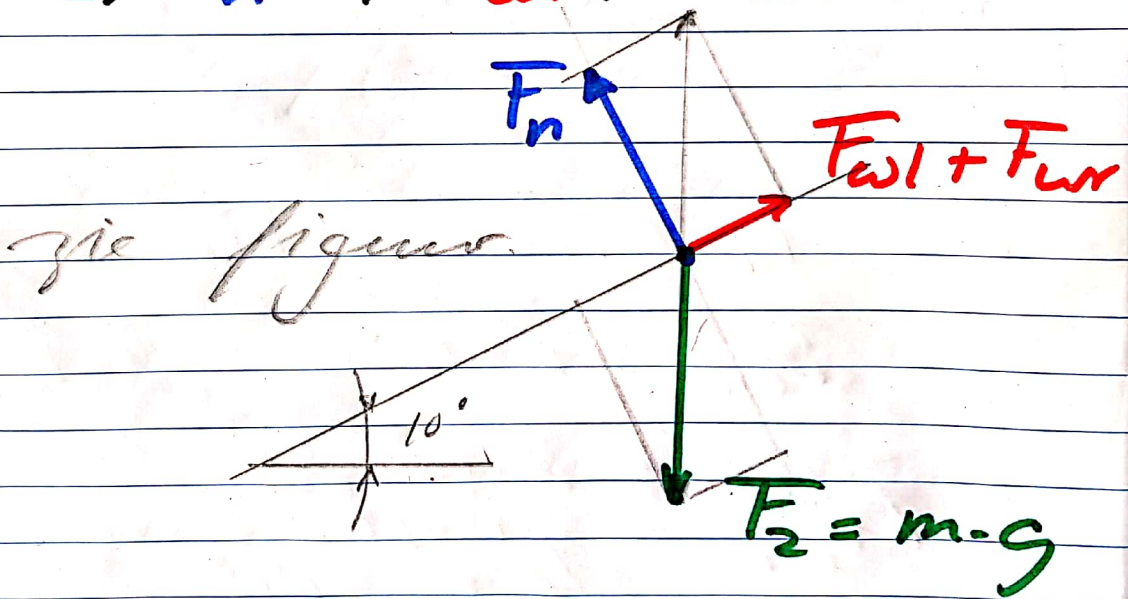
o

F_z recht omlaag
 F_n loodrecht op de helling

F_{wr} lucht laag op de helling

F_{wrd} rol wrijving $\Rightarrow F_{wrd}$

F_z ; F_n ; F_{wl} ; F_{wrd} .



$v = \text{constant}$
 $a = \emptyset$

} $\Sigma F_{res} = 0$

F_{wl} en F_{rd} zijn onbekend

77 Schenkspringen

zie figuur

$$F_{w,rol} = F_{w,glij} = \mu \cdot F_n$$

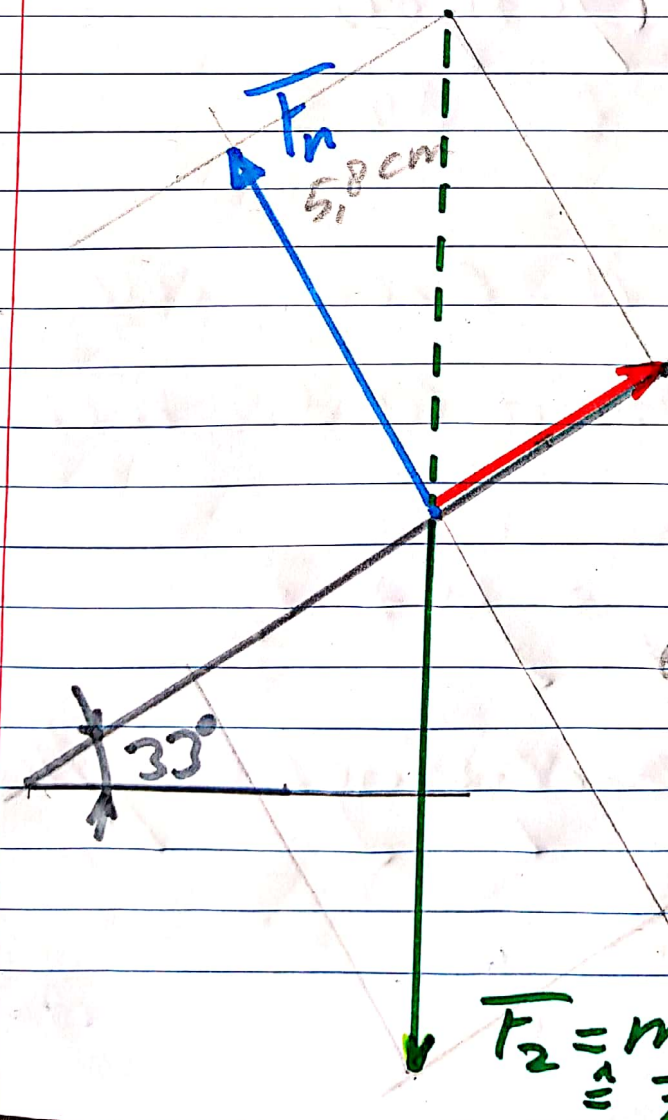
$$F_n = F_2 \cdot \cos \alpha$$

α groter
 $\cos \alpha$ kleiner
 F_2 constant

\Rightarrow F_n kleiner

μ constant

$F_{w,glij}$ kleiner



$$F_{w,glij} = F_2 \cdot \sin \alpha$$

$$= 700 \times 0,54$$

$$= 380 \text{ N}$$

eigenlijk

$$= 700 \times 9,81 \times \sin 33$$

$$= 3791 \text{ Newton}$$

$$F_2 = m \cdot g$$
$$\hat{=} 700 \cdot 9,81$$

$$77^d \quad F_n = 700 \times \cos 33^\circ \\ = 587 \text{ N}$$

eigengte

$$F_n = m \times g \times \cos 33^\circ \\ = 70 \times 9,81 \times \cos 33^\circ \\ = 576 \text{ N} \\ = \underline{5,8 \cdot 10^2 \text{ N}}$$

$$77^e \quad \frac{576}{(70 \times 9,81)} = 0,838$$

$$0,838 \hat{=} 84\%$$

f $F_{g,y}$ is even eens
verminderd met
16%

$$F_{w,g,y} = \mu \times F_n$$

μ = wrijvings coëfficiënt