Na 5-2

1 a E

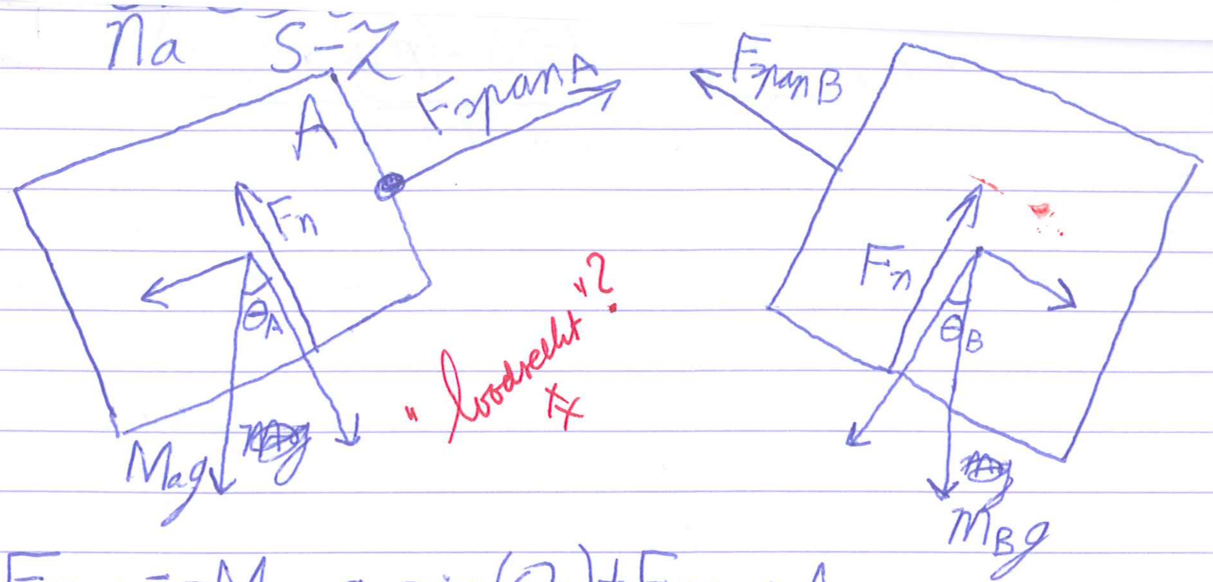
b B

c B

Na S-Z

Z

① /2



a) $F_{res_A} = -M_a g \cdot \sin(\theta_A) + F_{span A}$

$m_a \cdot a_a + m_a \cdot g \cdot \sin(\theta_A) - F_{span A} = 0$ (voor A)

$F_{res_B} = -F_{span B} + m_B g \sin(\theta_B)$

$m_B \cdot a_B + F_{span B} - m_B \cdot g \sin(\theta_B) = 0$ (voor B)

b) voor het totaal

Fspan A = Fspan B ×

① $F_{res_{A+B}} = -M_a g \sin(\theta_A) + m_B g \sin(\theta_B)$

$m_{A+B} \cdot a_{A+B} = g \cdot (m_B \sin(\theta_B) - m_A \sin(\theta_A))$

$a = a_{A+B} = g \cdot \frac{m_B \sin(\theta_B) - m_A \sin(\theta_A)}{m_A + m_B}$

c) $F_{verticaal} = m \cdot$ "$a_{verticaal}$"?

[illegible] toch?

$a_{verticaal A} = a \cdot \sin(\theta_A)$

$a_{verticaal B} = -a \cdot \sin(\theta_B)$

$F_{verticaal} = m_A \cdot a \cdot \sin(\theta_A) (?) m_B \cdot a \cdot \sin(\theta_B) =$ ×

$$a = g\,\frac{m_B \sin(\theta_B) - m_A \sin(\theta_A)}{m_A + m_B} \cdot \left(M_A \cdot \sin(\theta_A) - M_B \sin(\theta_B)\right) =$$

katrol nich vermeld!

$$-g \cdot \frac{\left(m_B \sin(\theta_B) - m_A \sin(\theta_A)\right)^2}{m_A + m_B}$$

T vermeld.

?

$$F_{horizontaal} = \underbrace{(m_A + m_B) \cdot a}_{F_{res\,x}} - \underbrace{\left(m_B \cdot g \sin(\theta_B) - m_A \cdot g \cdot \sin(\theta_A)\right)}_{F_x \text{ door normaalkracht}}$$

$$= g \cdot (M_B \cancel{g} \cdot \sin(\theta_B) - (m_A) \cancel{g} \sin(\theta_A)) - g \cdot (m_B \sin\theta_B - M_A \sin\theta_A)$$

$$= \cancel{0\ N}$$

hoe kan dat

2 verschillende gewichten onder verschillende hoeken (!?)

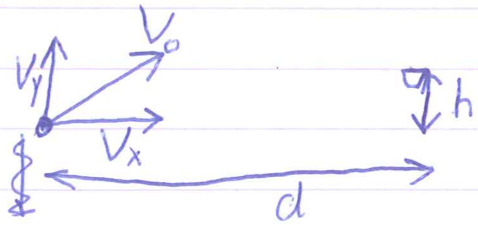
0/2

z

na S-Z

Netter en overzichtelijker werken!

3



$$V_y = \sin\theta \cdot V_0 - g t$$

$$\sin\theta \cdot V_0 t - \tfrac{1}{2} g t^2 = y(t)$$

1 b $t_{eind} = \dfrac{d}{V_x} = \dfrac{d}{V_0 \cdot \cos(\theta)}$

c op t_{eind} is het de bedoeling dat $y(t) = h$

als $y = h$

$$\sin(\theta) \cdot V_0 \cdot t - \tfrac{1}{2} g t^2 = h$$

$$\sin(\theta) \cdot V_0 \cdot \frac{d}{V_0 \cdot \cos\theta} - \frac{1}{2} g \cdot \frac{d^2}{V_0^2 \cdot \cos^2\theta} = h$$

$$\sin(\theta) \cdot V_0 \cdot \frac{d}{V_0 \cos(\theta)} = h + \frac{1}{2} g \frac{d^2}{V_0^2 \cos^2\theta}$$

z.o.z.

$$d \cdot \tan(\theta) - h = \frac{1}{2} g \frac{d^2}{V_0^2 \cos^2\theta}$$

$$V_0^2 = \frac{1}{2} g \frac{d^2}{(d \tan(\theta) - h) \cos^2\theta}$$

3

$$V_0 = \sqrt{\frac{g d^2}{2 d \tan(\theta) \cdot \cos^2(\theta) - h \cos^2\theta}}$$

a stel $v \sin\theta = \sqrt{2gh}$

dan $y(t) = \sqrt{2gh} \cdot t - \frac{1}{2} g t^2$

$V_y = \sqrt{2gh} - gt$

$V_y = 0$ geeft $\sqrt{2gh} - gt = 0$

$$t = \sqrt{\frac{2gh}{g^2}} = \sqrt{2\frac{h}{g}}$$

$$y_{tmax} = \sqrt{2gh} \cdot \sqrt{2\frac{h}{g}} - \frac{1}{2} g \cdot 2\frac{h}{g} =$$

1

$$\sqrt{4h^2} - h =$$

$$2h - h = h$$

dus als $v \sin(\theta) < \sqrt{2gh}$ is de maximum hoogte beneden de basket, dus moet $V \sin\theta > \sqrt{2gh}$ zijn

Na 5-2

4 a impuls na = impuls voor

1

impuls voor = $m \cdot V_1$

V_1 = snelheid van de kogel
m = massa van de kogel

~~Na~~ na de botsing hebben beide deeltjes dezelfde snelheid

impuls na = $(M+m) \cdot V_2$

V_2 is de snelheid van het blok en de kogel direct na de botsing

impuls na = impuls voor

$$(M+m) \cdot V_2 = m \cdot V_1$$

$$V_2 = \frac{m \cdot V_1}{M+m}$$

6 $\omega^2 = \frac{K}{M+m}$

1

$$\omega = \sqrt{\frac{K}{M+m}}$$

$$f = \frac{\omega}{2\pi} = \sqrt{\frac{K}{M+m}} \cdot \frac{1}{2\pi} = \frac{\sqrt{K}}{\sqrt{M+m} \cdot 2\pi}$$

6 $E_{kyn} \rightarrow E_{veer}$

1

$$V_2 = \frac{m V_1}{m+M}$$

$$E_{veer\,max} = E_{kyn\,max} = \frac{1}{2}(m+M)\cdot\left(m V_1 \cdot \frac{1}{m+M}\right)^2 =$$

$$\frac{1}{2} \cancel{m^2 V_1^2} \frac{m^2 V_1^2}{m+M}$$

$$E_{veer} = \frac{1}{2} k u^2$$

$$\frac{1}{2} K u^2 = \frac{1}{2} \frac{m^2 V_1^2}{m+M}$$

$$u^2 = \frac{m^2 V_1^2}{(m+M)\cdot K}$$

$$u = \sqrt{\frac{m^2 V_1^2}{(m+M)\cdot K}} = \frac{m V_1}{\sqrt{(m+M)\cdot K}}$$