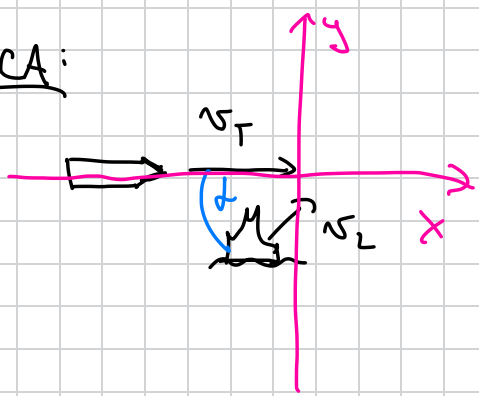
③ Titanik, ogromna ladja z maso 900 t, se s hitrostjo $v_T = 10\,m/s$ premika pod kotom $\alpha = 60°$ proti 500 t težki ledeni gori, ki se premika s hitrostjo $v_L = 1\,m/s$. Ko trčita se sprimeta.

a) v katero smer se premikata Titanik in ledena gora po trku?

b) S kolikšno hitrostjo se premikata?

a) SKICA:



Ker se sprimeta je trk neprožen 2

⇓

ohranja se le gibalna količina

$$\vec{G}_z = \vec{G}_L + \vec{G}_T$$

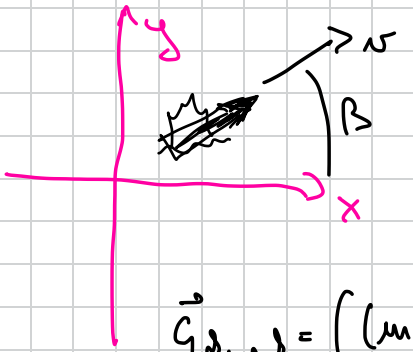
$$\vec{G}_T = (m_T v_T, 0)$$

$$\vec{G}_L = (m_L v_L \cos\alpha, m_L v_L \sin\alpha)$$

5

$$\vec{G}_z = (m_L v_L \cos\alpha + m_T v_T, m_L v_L \sin\alpha)$$

K:



$$\vec{G}_k = \vec{G}_{skupek}$$

5

$$\vec{G}_{skupek} = \left((m_L + m_T) v \cos\beta , (m_L + m_T) v \sin\beta \right)$$

Ohranja se gibalna količina:

$$\vec{G}_k = \vec{G}_z$$

3

$$\underline{x}: \quad m_L v_L \cos\alpha + m_T v_T = (m_L + m_T) v \cos\beta$$

$$\underline{y}: \quad m_L v_L \sin\alpha = (m_L + m_T) v \sin\beta$$

da dobim samo kot β

$\Rightarrow$ delim enačbo y z x

$$\frac{m_L v_L \sin\alpha}{m_L v_L \cos\alpha + m_T v_T} = \frac{(m_L + m_T) v \sin\beta}{(m_L + m_T) v \cos\beta}$$

$$\frac{m_L v_L \sin\alpha}{m_L v_L \cos\alpha + m_T v_T} = \tan\beta$$

3

$$\tan\beta = \frac{500\,t \cdot 1\,m/s \cdot \sin 60^\circ}{500\,t \cdot 1\,m/s \cdot \cos 60^\circ + 100\,t \cdot 10\,m/s} = \frac{433}{1250} = 0.3464$$

(II)

$\beta = 19.1°$ 2

b) Da dobim hitrost v, vstavim v enačbo z:

$$m_L v_L \sin\alpha = (m_L + m_T) v \sin\beta$$

$$v = \frac{m_L v_L \sin\alpha}{(m_L + m_T)\sin\beta} \quad 3 = \frac{500t \cdot 1\,m/s \cdot \sin 60°}{(500t + 100t) \cdot \sin 19.1°}$$

$$= \frac{433}{202.26} \frac{m}{s} = 2.14\,m/s \quad 2$$