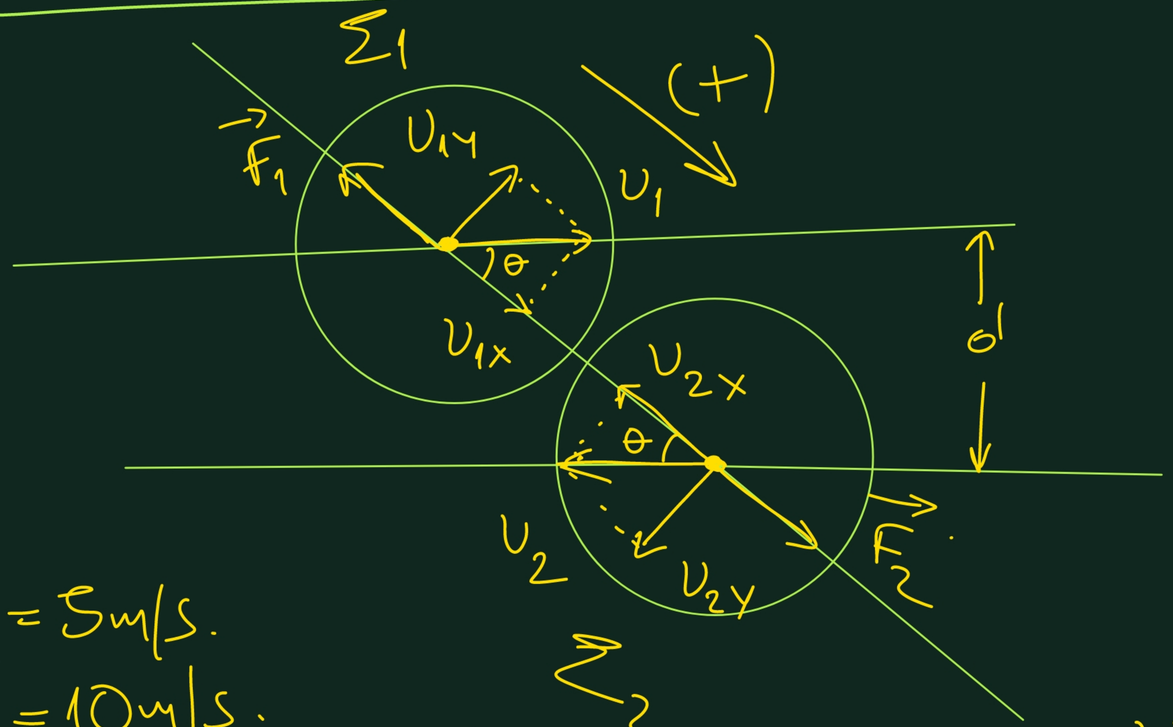
01/10/24

Абн. 2.179

$v'_{1y} = v_{1y}$

$v'_{2y} = v_{2y}$



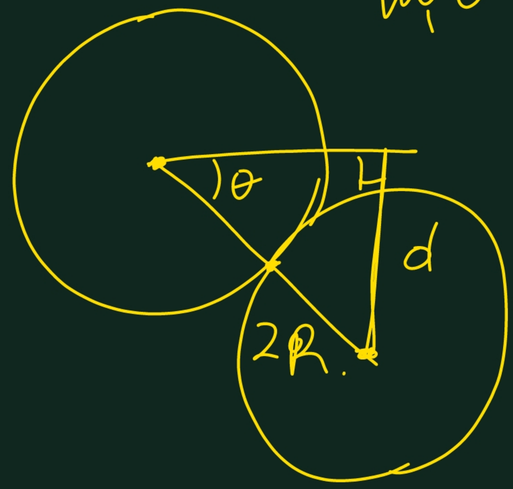
$v_1 = 5$ м/с.

$v_2 = 10$ м/с.

$d = 0{,}4$ м

$R = 0{,}25$ м

$\vec{F}_2 = -\vec{F}_1$ (3 закон NN)



$\cos\theta = \frac{d}{2R} = \frac{0{,}4}{0{,}5} \Rightarrow$

$\cos\theta = 0{,}8$

$\sin\theta = 0{,}6$.

$$v'_{1x} = \frac{m_1 - m_2}{m_1 + m_2} v_{1x} + \frac{2m_2}{m_1 + m_2} v_{2x}$$

$$v'_{2x} = \frac{2m_1}{m_1 + m_2} v_{1x} + \frac{m_2 - m_1}{m_1 + m_2} v_{2x}$$

$v_{1x} = v_1 \cos\theta = 3$ м/с

$v_{2x} = -v_2 \cos\theta = -6$ м/с

$$v_{1x}' = \frac{1-2}{1+2}\cdot 3 + \frac{2\cdot 2}{1+2}\cdot(-6) = -1-8 = -9\ \text{m/s}$$

$$v_{2x}' = \frac{2\cdot 1}{1+2}\cdot 3 + \frac{2-1}{1+2}\cdot(-6) = 2-2 = 0\ \text{m/s}.$$

$$v_{1y}' = v_{1y} = v_1 \cdot \sin\theta = 4\ \text{m/s}$$

$$v_{2y}' = v_{2y} = v_2 \cdot \sin\theta = 8\ \text{m/s}.$$

Acum: $v_2'^2 = v_{2x}'^2 + v_{2y}'^2 = 0^2 + 8^2 = 64 \Rightarrow$

$$v_2' = 8\ \text{m/s}.$$

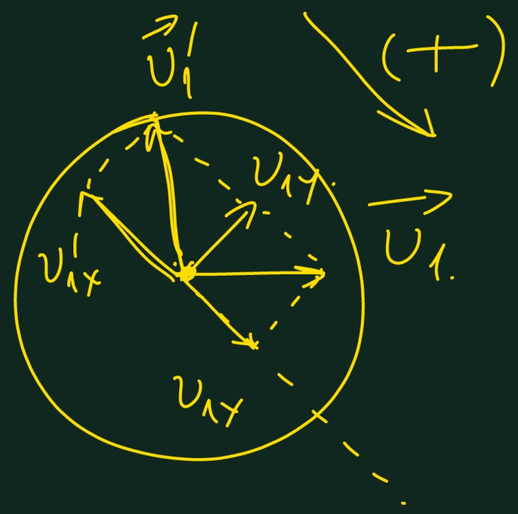
6) $K_2' = \frac{1}{2} m_2 (v_{2x}'^2 + v_{2y}'^2) =$

$= \frac{1}{2} m_2 v_2'^2 = \frac{1}{2}\cdot 2 \cdot 8^2 = 64\ \text{J}.$

$K_2 = \frac{1}{2} m_2 v_2^2 = 100\ \text{J}.$

$$\frac{\Delta K_2}{K_2}\cdot 100 = \frac{K_2' - K_2}{K_2}\cdot 100 = -36\%$$

γ)



$$\left(\begin{array}{l} \Delta P_{1x} = -12\ \text{kg}\cdot\text{m/s} \\ \Delta P_{1y} = m_1 v_{1y}' - m_1 v_{1y} = 0 \end{array}\right)$$

$v_{1x}' = -9\ \text{m/s}$

$\Delta P_1 = m_1 v_{1x}' - m_1 v_{1x} =$

$= 1\cdot(-9) - 1\cdot 3 = -9-3 = -12\ \text{kg}\cdot\text{m/s}$

'Αρα: $|\Delta \vec{P}_1| = 12\ \text{kg}\cdot\text{m/s}$.