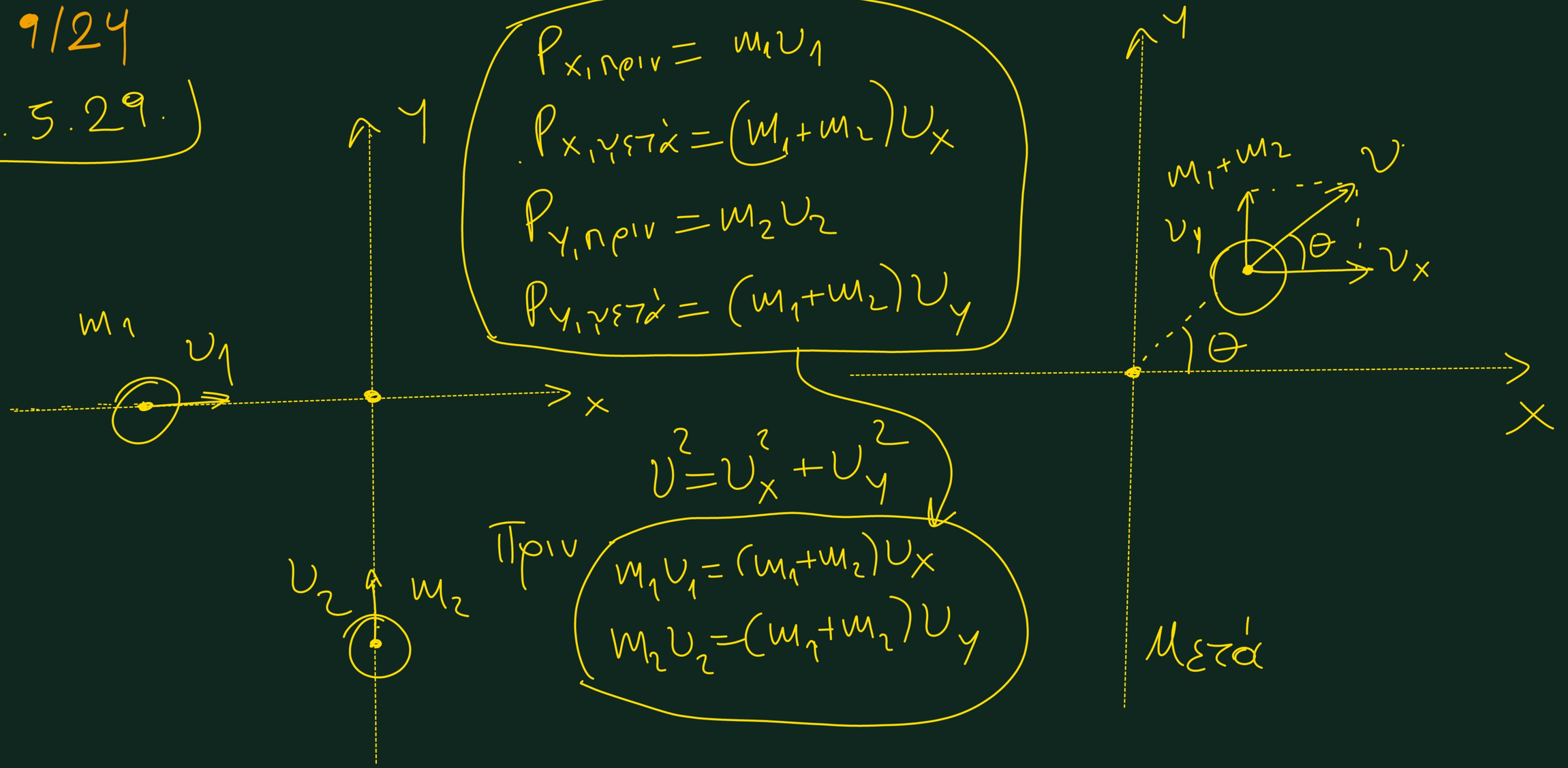
16/9/24

Ασκ. 5.29.)



$$P_{x,\text{πριν}} = m_1 v_1$$

$$P_{x,\text{μετά}} = (m_1+m_2) v_x$$

$$P_{y,\text{πριν}} = m_2 v_2$$

$$P_{y,\text{μετά}} = (m_1+m_2) v_y$$

$$v^2 = v_x^2 + v_y^2$$

Πριν

$$m_1 v_1 = (m_1+m_2) v_x$$

$$m_2 v_2 = (m_1+m_2) v_y$$

$$(m_1+m_2)^2 v_x^2 + (m_1+m_2)^2 v_y^2 = m_1^2 v_1^2 + m_2^2 v_2^2 \Rightarrow$$

$$(m_1+m_2)^2 (v_x^2+v_y^2) = (m_1 v_1)^2 + (m_2 v_2)^2 \Rightarrow$$

$$v^2 = \frac{(m_1 v_1)^2 + (m_2 v_2)^2}{(m_1+m_2)^2} \Rightarrow v^2 = \frac{(6\cdot 8)^2 + (4\cdot 9)^2}{100} \Rightarrow$$

$$v^2 = \frac{48^2+36^2}{100} = \frac{9\cdot 16^2 + 16\cdot 9^2}{100} = \frac{9\cdot 16(16+9)}{100} =$$

$$= \frac{9\cdot 16\cdot 25}{100} = \frac{9\cdot 400}{100} =$$

$$= 36$$

Άρα: $v = 6\ m/s$.

$$m_1 u_1 = (m_1 + m_2) u_x \Rightarrow$$

$$6 \cdot 8 = 10 \cdot u_x \Rightarrow$$

$$u_x = 4,8 \text{ m/s}$$

$$m_2 u_2 = (m_1 + m_2) u_y \Rightarrow$$

$$4 \cdot 9 = 10 u_y \Rightarrow$$

$$u_y = 3,6 \text{ m/s}$$

$$\varepsilon\varphi\theta = \frac{u_y}{u_x} = \frac{3,6}{4,8} = \frac{36}{48} = \frac{3 \cdot 12}{4 \cdot 12} = \frac{3}{4}$$

β) $\Delta K = K_{\mu\varepsilon\tau\acute{\alpha}} - K_{\pi\rho\acute{\iota}\nu} \Rightarrow$

$$\Delta K = \frac{1}{2}(m_1 + m_2) u^2 - \frac{1}{2} m_1 u_1^2 - \frac{1}{2} m_2 u_2^2 =$$

$$= \frac{1}{2} \cdot 10 \cdot 36 - \frac{1}{2} \cdot 6 \cdot 64 - \frac{1}{2} \cdot 4 \cdot 81 =$$

$$= 180 - 192 - 162 = -174 \text{ Joule}$$

Αδυ. 5.27

$K_1 = K_1' + K_2'$

$K_2' = K_{2max}'$

γίνο αν

$K_1' = 0$

αφού $K \geq 0$ πάντα

Άρα πρέπει να ισχύει: $U_1' = 0 \Rightarrow$

$m_1 = m_2$

5.41 - 5.45

5.47, 5.48