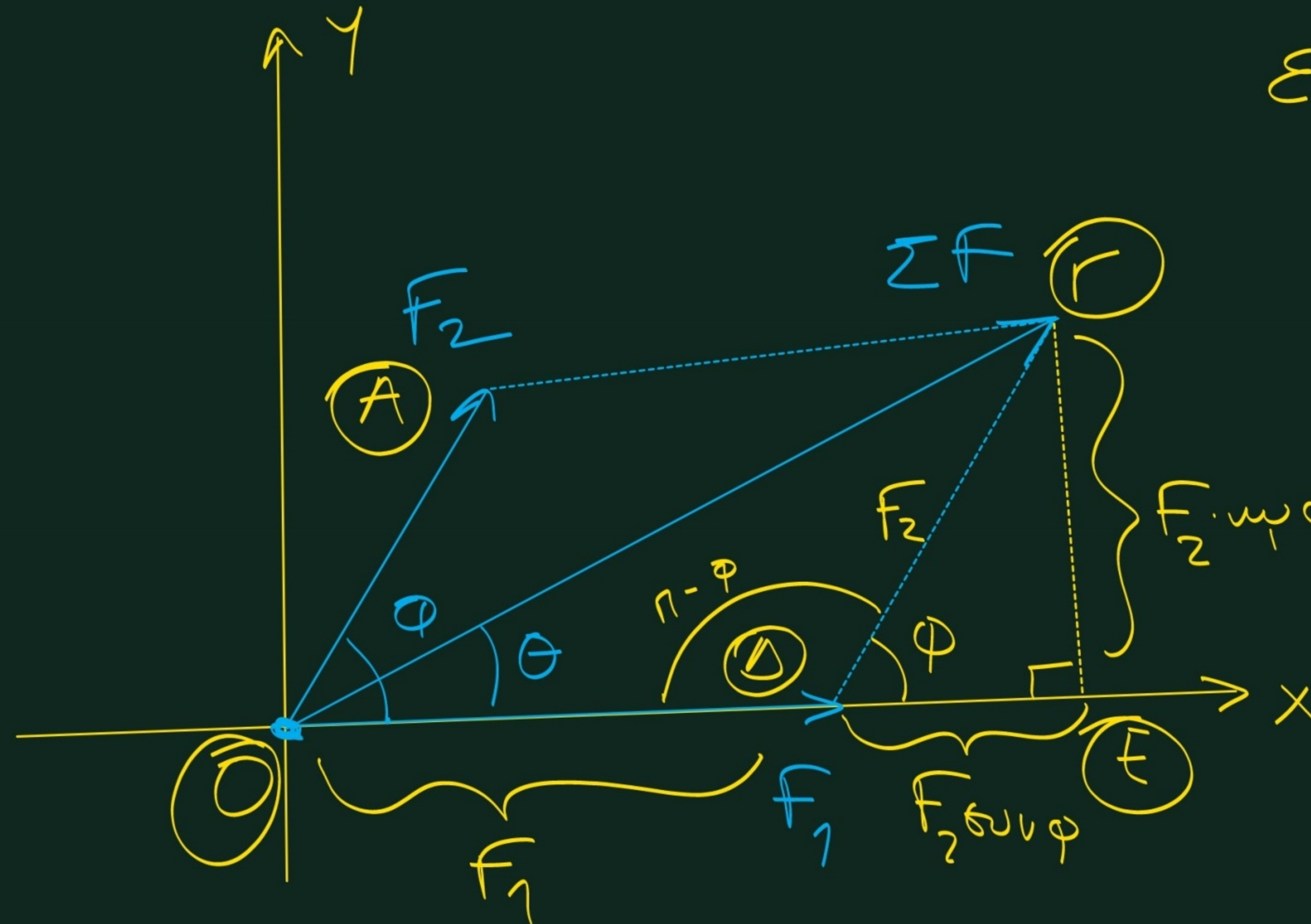


Σύνθεση δυνάμεων

Κανόνας παραλληλογράμμου.



$$\Sigma F = \sqrt{F_1^2 + F_2^2 + 2F_1F_2 \cos \varphi}$$

(από το νόμο των συνυφιστόνων στο $\triangle O\Gamma\Delta$)

$$\varepsilon\varphi\theta = \frac{\Gamma E}{OE} = \frac{\Gamma E}{OD + DE} \Rightarrow$$

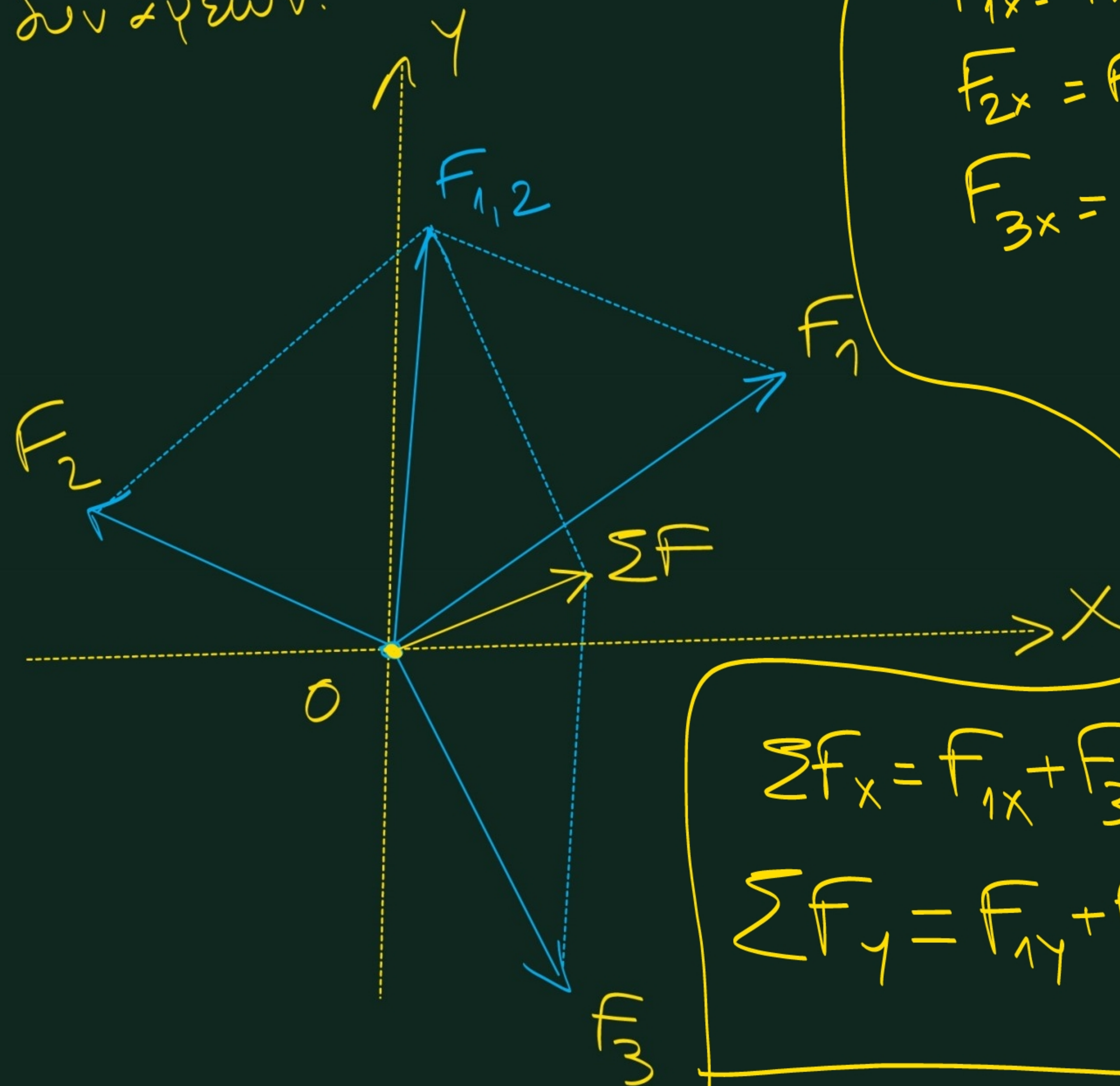
$$\varepsilon\varphi\theta = \frac{F_2 \cdot \omega\varphi}{F_1 + F_2 \cdot \cos \varphi}$$

(Από το νόμο των υφιστόνων στο $\triangle O\Gamma\Delta$)
έχουμε:

$$\frac{OD}{\omega(\pi - \varphi)} = \frac{\Gamma D}{\omega\theta} \Rightarrow \frac{\Sigma F}{\omega\varphi} = \frac{F_2}{\omega\theta} \Rightarrow$$

$$\omega\theta = \frac{F_2}{\Sigma F} \cdot \omega\varphi$$

Σύνθεση πολλών ομοεπίπεδων
δυνάμεων.



$$F_{1x} = F_1 \cdot \cos \theta_1$$

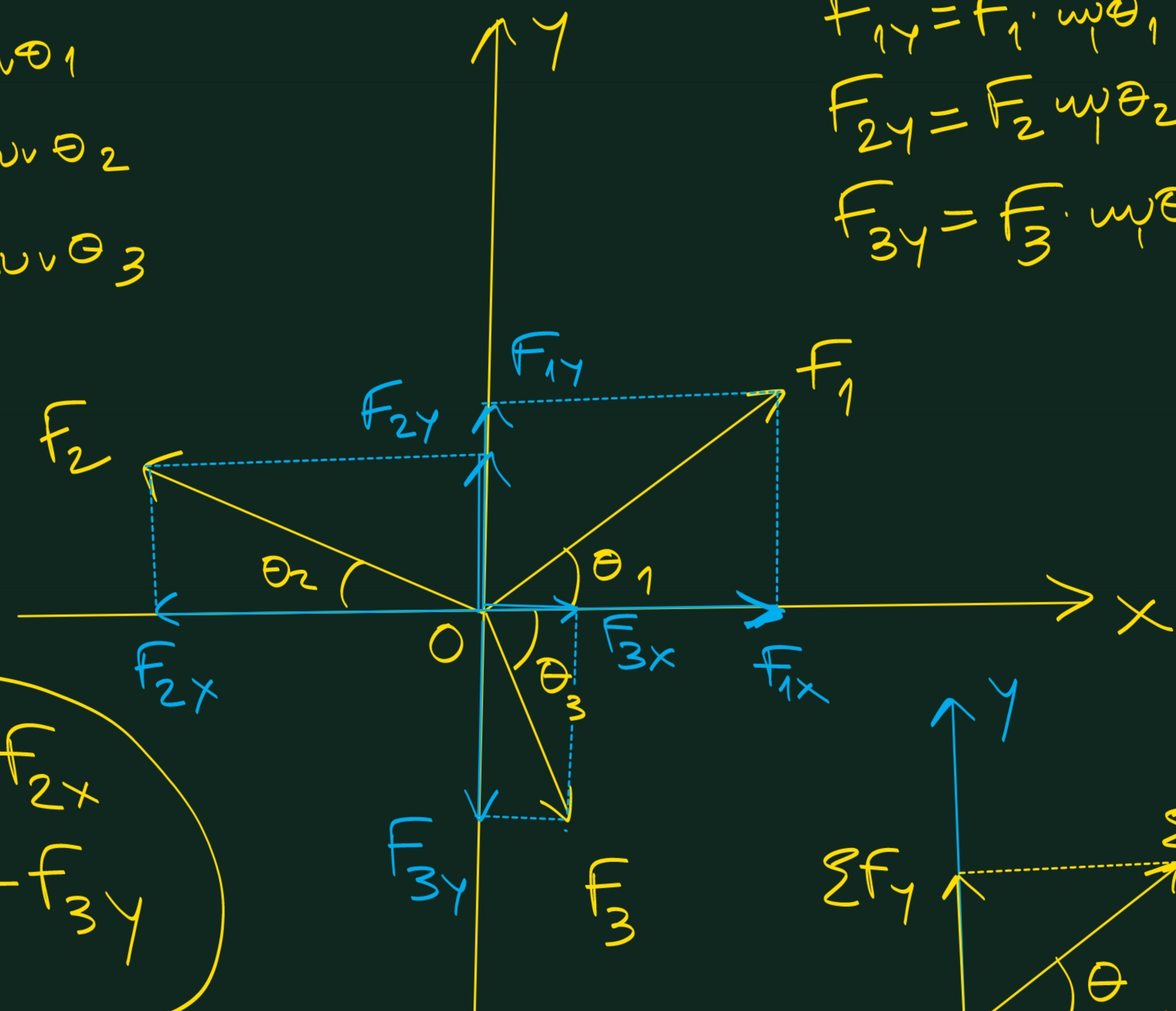
$$F_{2x} = F_2 \cdot \cos \theta_2$$

$$F_{3x} = F_3 \cdot \cos \theta_3$$

$$\Sigma F_x = F_{1x} + F_{3x} - F_{2x}$$

$$\Sigma F_y = F_{1y} + F_{2y} - F_{3y}$$

Σύνθεση 2 ή 3 δυνάμεων σε
συμμετρικές.



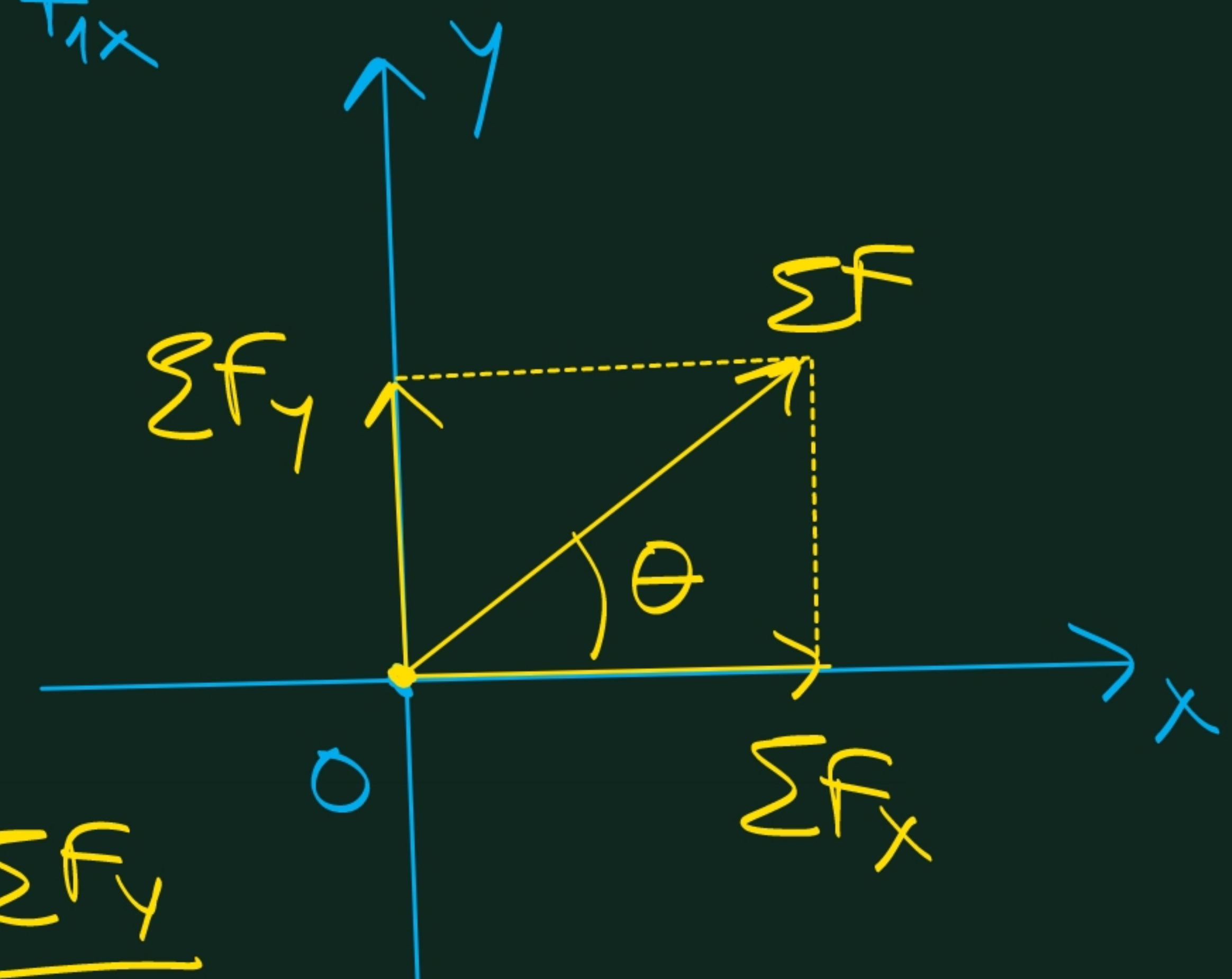
$$F_{1y} = F_1 \cdot \sin \theta_1$$

$$F_{2y} = F_2 \cdot \sin \theta_2$$

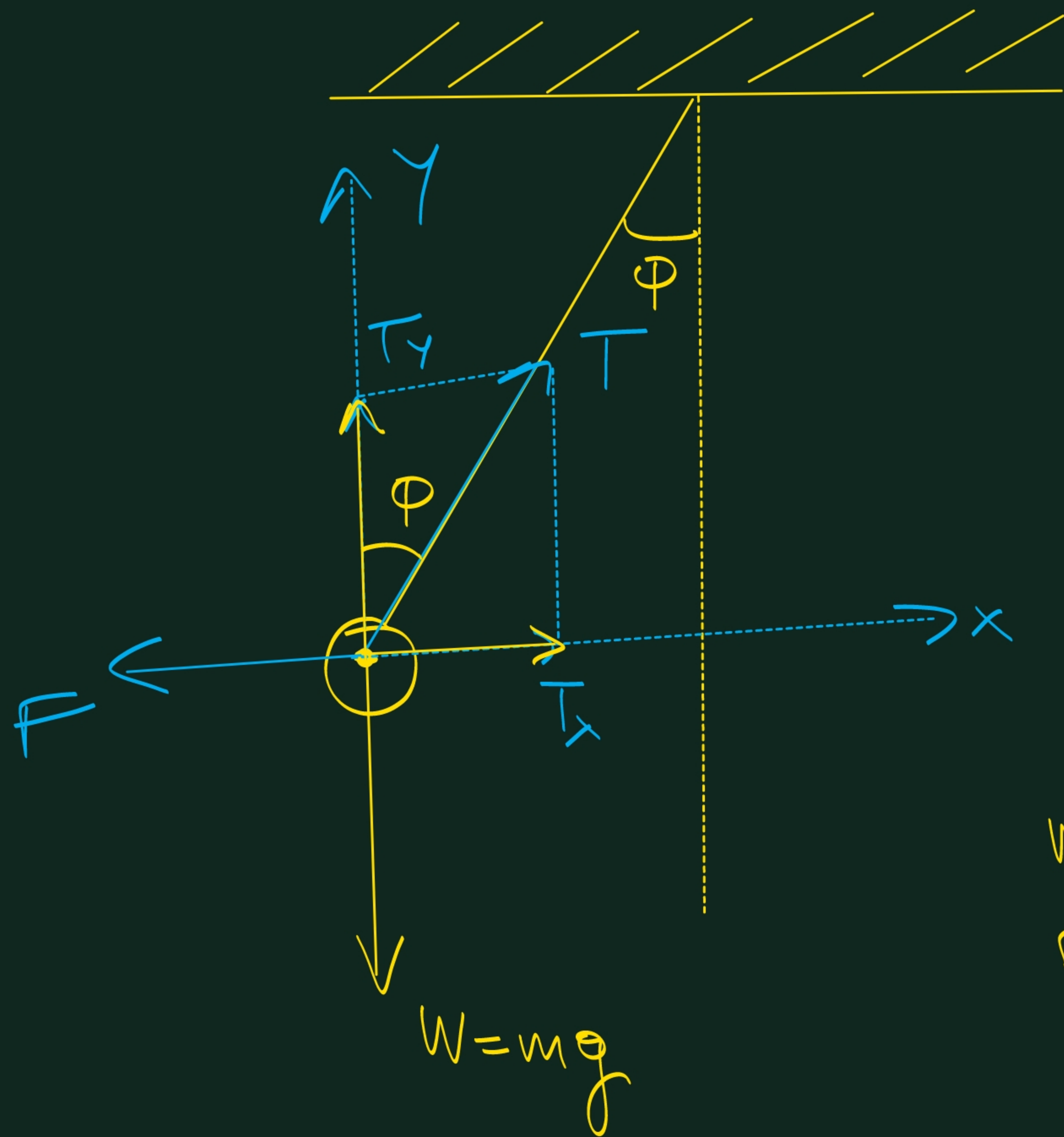
$$F_{3y} = F_3 \cdot \sin \theta_3$$

$$\Sigma F = \sqrt{\Sigma F_x^2 + \Sigma F_y^2}$$

$$\varepsilon \phi \theta = \frac{\Sigma F_y}{\Sigma F_x}$$



Παραδείγματα 6ε2.11α



$$\cos \varphi = 0,6$$

$$\sin \varphi = 0,8$$

$$W = 10 \text{ N}$$

$$T = ;$$

$$F = ;$$

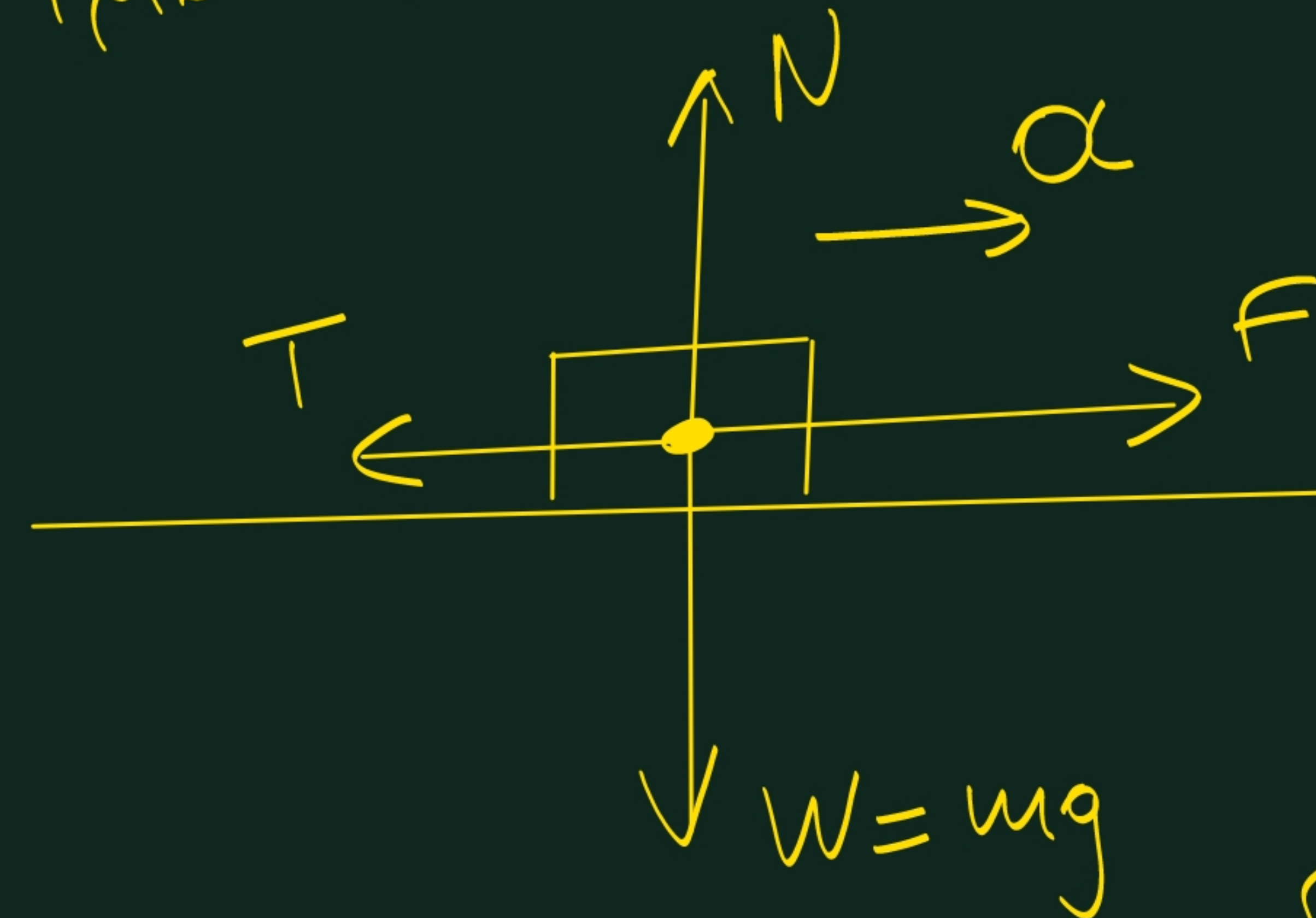
$$\Sigma F_x = 0 \Rightarrow T_x - F = 0 \Rightarrow F = T_x \Rightarrow F = T \cdot \cos \varphi$$

$$\Sigma F_y = 0 \Rightarrow T_y - W = 0 \Rightarrow W = T_y \Rightarrow W = T \cdot \sin \varphi$$

$$W = T \cdot \sin \varphi \Rightarrow 10 = T \cdot 0,8 \Rightarrow T = 12,5 \text{ N}$$

$$F = T \cdot \cos \varphi \Rightarrow F = 12,5 \cdot 0,6 \Rightarrow F = 7,5 \text{ N}$$

Τριβή ολίσθησης



$$T = \mu N$$

$$\Sigma F_y = 0 \Rightarrow$$

$$N = mg$$

$$\Sigma F_x = ma \Rightarrow$$

$$F - T = ma \Rightarrow$$

$$F - \mu mg = ma$$