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Вариант 8

№1 Дано

$m = 20$ кг

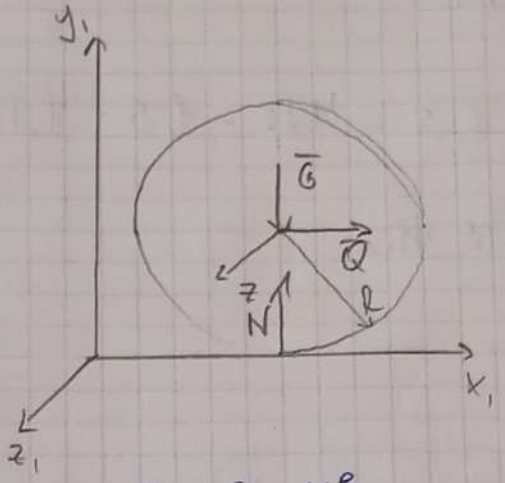
$Q = 120$ Н

$F_{тр} = 40$ Н

$R = 0,5$ м

$I_{cz} = 0,9$ кг·м²

ε – ?



1 $I_{cz}\varepsilon = M_z^e$

2 $M_z^e = F_{тр} \cdot R$

$I_{cz}\varepsilon = F_{тр} R$

$\varepsilon = \frac{F_{тр} R}{I_{cz}}$

$\varepsilon = \frac{40 \cdot 0,3}{0,9} = 13,33 \frac{рад}{с}$

№2 Дано

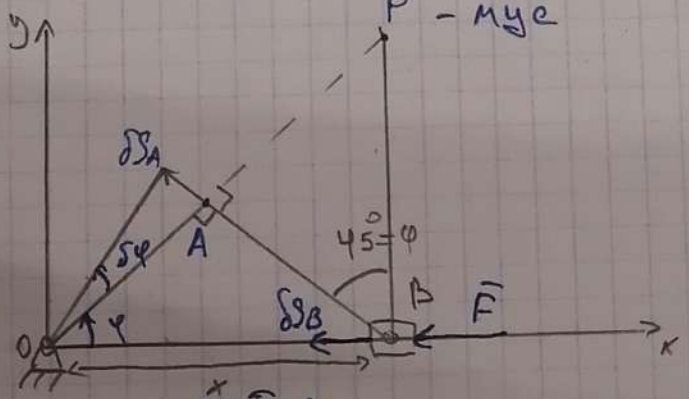
$OA = AB = 0,2$ м

$\varphi = 45°$

$F = 20$ Н

$M = 1,5$ Н·м

Q_φ – ?



1) $Q_\varphi = \frac{\sum \delta A_\varphi}{\delta \varphi}$

2) $\sum \delta A_\varphi = F \cdot \delta S_B - M \delta \varphi$

$\delta S_A = OA \cdot \delta \varphi$

$\frac{\delta S_A}{\delta S_B} = \frac{AP}{BP}$

$\Rightarrow \delta S_B = \delta S_A \cdot \frac{BP}{AP} = \frac{\delta S_A}{\sin \varphi}$

$$\Sigma \delta A_y = F \cdot \frac{OA}{\sin\varphi} \cdot \delta\varphi - M\delta\varphi$$

$$Q_\varphi = \frac{F \cdot OA}{\sin\varphi} - M$$

$$Q_\varphi = \frac{20 \cdot 0{,}2}{\sin 45^\circ} - 1{,}5 = 4\sqrt{2} - 1{,}5 = 4{,}16 \text{ Н} \cdot \text{м}$$

Ответ: $Q_\varphi = 4{,}16$ Н·м