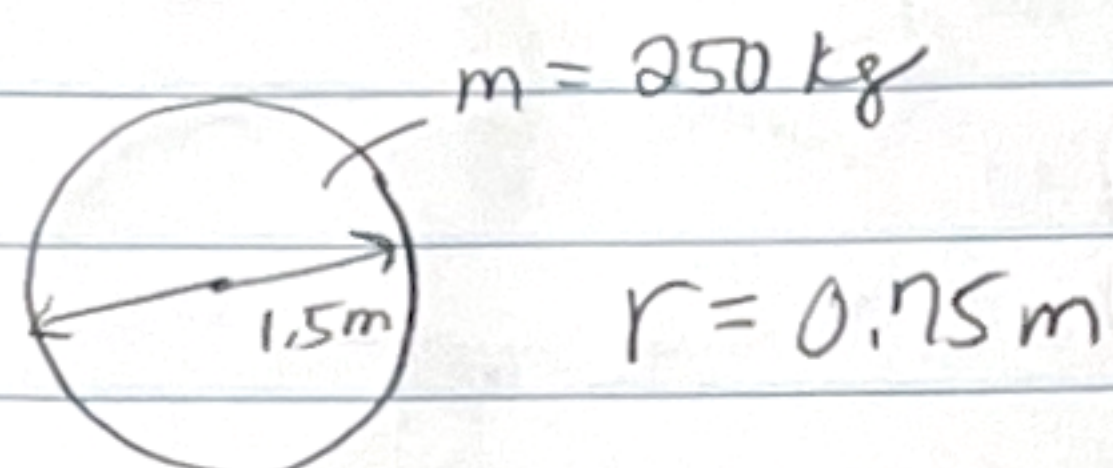


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$$\text{max rpm} = 1200 \text{ rpm}$$

a) $\tau = 50 \text{ Nm}$

$\Delta t = ?$

$\omega_i = 0$

$\omega_f = 1200 \frac{\text{rev}}{\text{min}} \left(\frac{2\pi \text{ rad}}{1 \text{ rev}} \right) \frac{1 \text{ min}}{60 \text{ s}}$

$= 126 \text{ rad/s}$

$\alpha =$

$\Delta \theta =$

Not enough kinematics info.

$$\Sigma \tau = I \alpha$$

I can find I:

Disk: $I = \frac{1}{2} MR^2$

$= \frac{1}{2} (250 \text{ kg}) (0.75 \text{ m})^2$

$= 70.31 \text{ kg} \cdot \text{m}^2$

$$\Sigma \tau = I \alpha$$

$50 \text{ Nm} = (70.31 \text{ kg} \cdot \text{m}^2) \alpha$

$0.711 \frac{\text{rad}}{\text{s}^2} = \alpha$

Now I can find Δt using kinematics:

$\omega_f = \omega_i + \alpha \Delta t$

$(126 \text{ rad/s}) = 0 + (0.711 \text{ rad/s}^2) \Delta t$

$177 \text{ s} = \Delta t$