

A torque of 0.12 Nm is applied to an egg beater.

1) If the egg beater starts from rest what is its angular momentum after 0.50 s ?

2) If $I = 2.5 \times 10^{-3} \text{ kg m}^2$ what is its angular speed after 0.50 s ?

Recall $F \Delta t = \Delta p$

$$\Rightarrow \tau \Delta t = \Delta L$$

$$1) \quad \tau \Delta t = \Delta L = L_f - \cancel{L_i} \rightarrow 0$$

$$(0.12 \text{ Nm})(0.50 \text{ s}) = L_f$$

$$\boxed{6.0 \times 10^{-2} \frac{\text{kg m}^2}{\text{s}} = L_f}$$

2) $\tau \Delta t = L_f = I \omega$

$$\frac{\tau \Delta t}{I} = \omega$$

$$\frac{0.12 \text{ Nm} (0.50 \text{ s})}{2.5 \times 10^{-3} \text{ kgm}^2} = \omega = \boxed{\frac{24 \text{ rad}}{5}}$$