

Solutions

Each answer shows the steps, then the **result**.

2.1

- the net external torque on the system must be zero

2.2

- $I_i\omega_i = I_f\omega_f \Rightarrow 4.0(2.0) = 1.0\omega_f$, so $\omega_f = 8.0 \text{ rad s}^{-1}$

2.3

- $L = I\omega$ is conserved; reducing I must raise ω to keep the product constant

3.1 B

3.2 A

3.3

(a)

- $I_{\text{clay}} = mr^2 = 0.20(0.30)^2 = 0.018 \text{ kg m}^2$

(b)

- $I_i\omega_i = I_f\omega_f \Rightarrow 0.10(6.0) = (0.10 + 0.018)\omega_f$, so $\omega_f = \frac{0.60}{0.118} = 5.1 \text{ rad s}^{-1}$