

Solutions

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

2.1

- When the net external torque is zero

2.2

- $6(2) = 2\omega_f \Rightarrow \omega_f = 6 \text{ rad s}^{-1}$

2.3

- It doubles

2.4

- No

3.1 B

- zero net external torque

3.2 C

- $I \rightarrow I/3$ means $\omega \rightarrow 3\omega$

3.3

(a)

- $4(3) = 6\omega_f \Rightarrow \omega_f = 2 \text{ rad s}^{-1}$

(b)

- Yes — no external torque acts on the turntable-plus-clay system

3.4

(a)

- Tucking lowers I ; since $I\omega$ is fixed, ω rises

(b)

- Gravity acts through the center of mass, giving no torque about it