

$$J = \int_{-\frac{L}{2}}^{\frac{L}{2}} r^2 dm \quad | \quad dm = \rho \cdot dV$$

$$J = \int_{-\frac{L}{2}}^{\frac{L}{2}} r^2 \cdot \rho \cdot dV \quad | \quad dV = A \cdot dr$$

$$J = \int_{-\frac{L}{2}}^{\frac{L}{2}} (r^2 \rho A) dr$$

$$J = \frac{1}{3} r^3 \rho A \Big|_{-\frac{L}{2}}^{\frac{L}{2}}$$

$$J = \frac{1}{3} \rho A \left[\left(\frac{L}{2}\right)^3 - \left(-\frac{L}{2}\right)^3 \right]$$

$$J = \frac{1}{3} \rho A \left(\frac{L^3}{8} + \frac{L^3}{8} \right)$$

$$J = \frac{1}{3} \rho A \frac{2}{8} L^3$$

$$J = \frac{\rho A L^3}{12}$$

$$m = \rho A L$$

⇓

$$J = \frac{1}{12} m L^2$$

J äquatorial