6. Newton's Second Law of Rotational Motion relates the torque to the moment of inertia and angular acceleration as

$$\tau = I \alpha$$

We are interested in the angular acceleration, so we divide both sides of the equation by the moment of inertia to get

$$\alpha = \tau / I$$

$$\alpha = (30 \text{ N m}) / (5.0 \text{ kg m}^2) = (6 \text{ m kg m } / \text{s}^2) / (\text{kg m}^2)$$

$$\alpha = 6.0 \text{ rad} / \text{s}^2$$