

Solutions

2.1 A For a rigid body about a fixed axis, net torque equals moment of inertia multiplied by angular acceleration. Rotational kinetic energy depends on angular speed squared. Angular momentum is conserved when net external torque is zero.

2.2 Torque=force $\times$ perpendicular distance= $12\times 0.25=3.0$ N m.

2.3 False. Torque has unit N m but is a turning effect, not an energy store. Moment of inertia changes if the same mass moves farther from the axis.

2.4 torque. torque means Turning effect about an axis.

3.1 Torque= $rF \sin 30^\circ=3.0$ N m; perpendicular torque= 6.0 N m. Use the perpendicular moment arm and state the rotation sign convention.