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Crash Course Physics #12: Torque

Name: _____ Date: _____

You can access the video here → <https://youtu.be/5-HZ1SZPaQw?si=DRdTD96fTLc3mCs>

- _____ is the quantity that causes an object to rotate, similar to how force causes linear acceleration.
- Torque depends on three factors: the strength of the force, the radius, and the _____ between the force and the radius.
- Torque is calculated by multiplying the perpendicular force by the _____.
- The moment of _____ measures an object's resistance to changes in its rotational motion.
- An object's moment of inertia depends on both its mass and how that mass is _____.
- The farther the mass is from the axis of rotation, the _____ the moment of inertia.
- Work done by a torque is the integral of torque over a certain _____.
- Rotational kinetic energy is equal to one-half the moment of inertia times _____ squared.
- Angular _____ is equal to the moment of inertia times angular velocity.
- Angular momentum, like linear momentum, is always _____.
- At the top of a ramp, an object's energy is in the form of _____ potential energy.
- The box reaches the bottom of the ramp first because it doesn't have any _____ motion.
- The _____ reaches the bottom of the ramp last due to its high moment of inertia.
- The _____ reaches the bottom of the ramp second because its mass is distributed closer to the center.
- When comparing objects on the ramp, their _____ do not affect the outcome of the race.

Crash Course Physics #12: Torque KEY

- Torque** is the quantity that causes an object to rotate, similar to how force causes linear acceleration.
- Torque depends on three factors: the strength of the force, the radius, and the **angle** between the force and the radius.
- Torque is calculated by multiplying the perpendicular force by the **radius**.
- The moment of **inertia** measures an object's resistance to changes in its rotational motion.
- An object's moment of inertia depends on both its mass and how that mass is **distributed**.
- The farther the mass is from the axis of rotation, the **greater** the moment of inertia.
- Work done by a torque is the integral of torque over a certain **angle**.
- Rotational kinetic energy is equal to one-half the moment of inertia times **angular velocity** squared.
- Angular **momentum** is equal to the moment of inertia times angular velocity.
- Angular momentum, like linear momentum, is always **conserved**.
- At the top of a ramp, an object's energy is in the form of **gravitational** potential energy.
- The box reaches the bottom of the ramp first because it doesn't have any **rotational** motion.
- The **ring** reaches the bottom of the ramp last due to its high moment of inertia.
- The **marble** reaches the bottom of the ramp second because its mass is distributed closer to the center.
- When comparing objects on the ramp, their **masses** do not affect the outcome of the race.

15 Questions

Answer Key Included

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