11 Physics: Torque

Curriculum: IB

Material Slides

1. Torque is the rotational equivalent of force, defined as the product of force and the perpendicu
2. The formula for torque is $\tau = r \times F$, where τ is the torque, r is the distance from the pivot point t
3. The SI unit of torque is the Newton-meter (N·m) or Joule (J).
4. Torque can be both positive and negative, depending on the direction of rotation. Clockwise ro
5. The principle of moments states that for an object in rotational equilibrium, the sum of the torqu
6. The torque due to a force acting at an angle can be calculated using the equation $\tau = r \times F \times si$
7. In a simple machine like a lever, torque can be used to magnify the force applied, allowing for
8. The moment of inertia (I) of an object is a measure of its resistance to changes in rotational mo
9. The relationship between torque, angular acceleration, and moment of inertia is given by the e
10. Torque can also be calculated using the formula $\tau = I \times \omega \times \alpha$, where ω is the angular velocity
11. Understanding torque is essential in various physics applications, such as designing machine

Practice Problems

1. Calculate the force exerted by a 5 kg object accelerating at 2 m/s^2.
2. What is the potential energy of a 10 kg object at a height of 5 meters?

References

1. Physics for the IB Diploma, K.A. Tsokos

2. Advanced Physics, Steve Adams