

Strings and Tension

PHYS 2425

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September 25, 2025

1. Conceptual Questions

A. A ball is dropped from a certain height. Ignoring air resistance, how is the work done by gravity affected by the path it takes on the way down?

B. Friction is a non conservative force. What does this mean in terms of energy transfer? Where does the energy go?

C. Suppose you push a sled up a rough hill. How does the work you do compare with the work that gravity does?

D. If friction always converts mechanical energy into thermal energy, how can a car's brakes (which use friction) make a car slow down? Does this violate energy conservation?

2. Work and Energy Problems

1. A ball of mass m is pushed up a rough incline at θ degrees relative to the horizontal axis. The block is pushed a distance L along the incline by a force applied parallel to the incline. The coefficient of friction is μ_k . How much work is done by friction? What is the minimum force to push the block up the incline at a constant speed?

2. A block of mass m_1 sits on a rough horizontal surface with coefficient of kinetic friction μ_k . It is connected by a physics string over a massless, frictionless pullet to a hanging block m_2 . The system is released from rest and the blocks move. Write an expression for the work done by friction on block m_1 after it has moved a distance d . What is the final speed v of the blocks after m_2 has dropped a distance h ?