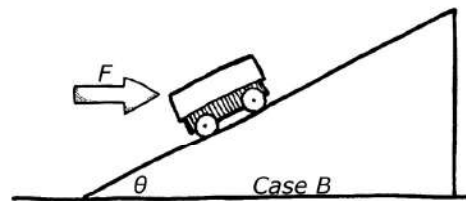
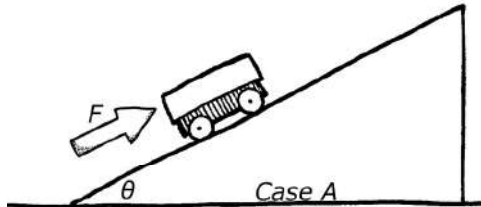


NAME _____ DATE _____

Scenario

Consider a cart on a smooth incline. The incline makes an angle θ with the horizontal. In two cases, the cart is pushed up the incline by a force F , whose magnitude is greater than the weight of the cart. In Case A, the force is applied parallel to the incline; in Case B, the force is applied horizontally (parallel to the ground). In both cases, the cart is pushed from rest a length L up the incline and attains a final speed v_A in Case A and a final speed v_B in Case B.



Argumentation

PART A: The two final speeds are related according to the inequality $v_A > v_B$.

- i. Explain why this is the case by discussing specific forces and force components.

- ii. Explain why this is the case by discussing specific energy transformations.

[illegible]

Quantitative Analysis

PART B: Using either Newton's second law and a kinematics equation or using principles of work and energy, write equations for the following in terms of m , g , L , θ , and F .

i. The speed v_A

ii. The speed v_B

4.E Comparisons of Work by Identical Forces

PART C: Explain how your two equations from Part B support the idea that $v_A > v_B$. Also explain how your two equations support your answer to either Part A (i) or Part A (ii), depending on whether you used forces or energy in Part B.
