

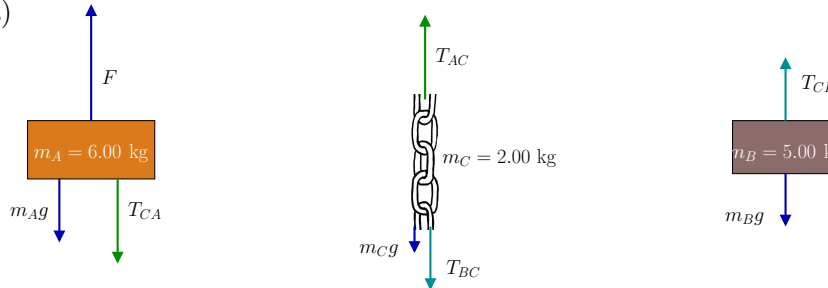
Phys 218 – Fall 2016

All Sections

Physics 218 – Exam II

- Short Answer:**
- 1) $F = 1.39 \times 10^6 \text{ N}$.
 - 2) $\mu_s = 0.577$.
 - 3) $h' = 4h$.
 - 4) Point A because $\vec{F} = -\vec{\nabla}U$ and the slope is steepest at A .

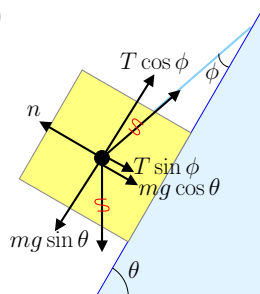
Problem 1: (a)



T_{AC}/T_{CA} and T_{CB}/T_{BC} are action-reaction pairs.

- (b) $a = 13.3 \text{ m/s}^2$.
- (c) $T_{AC} = 162 \text{ N}$.

Problem 2: (a)



where $\phi = 19.5^\circ$.

- (b) $T = 0.918Mg$.
- (c) $n = 0.806Mg$ is the same magnitude as the normal force of the incline on the block through Newton's 3rd law.

Problem 3: (a) $W = 1128 \text{ J}$.

- (b) To get all of his force opposing the motion down the incline, he should push up on the cart parallel to the incline (opposite \vec{v} as drawn in the figure).
- (c) $w = 194 \text{ lbs}$.

Problem 4: (a) $k = \frac{mv_0^2}{d^2}$.

- (b) $v = \frac{\sqrt{3}}{2} v_0$.

- (c) $\Delta x = \frac{\mu_k g d^2}{v_0^2} \left[\sqrt{1 + \left(\frac{v_0^2}{\mu g d} \right)^2} - 1 \right]$.