

## Exercises in Physics Assignment

Date Given: June 2, 2022

Date Due: June 9, 2022

- P1.** (2 points) Determine the tension  $P$  in the cable which will give the 50kg block a steady acceleration of  $2\text{m/s}^2$  up the incline. The kinetic friction coefficient is given as  $\mu_k = 0.25$ .

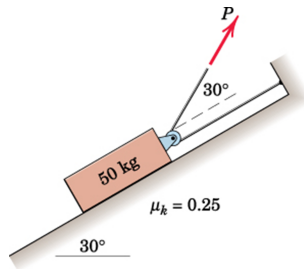


Figure 1: Illustration to Problem 1.

- P2.** (3 points) Determine the vertical acceleration of the 30kg cylinder for each of the two cases. Neglect friction and the mass of the pulleys.

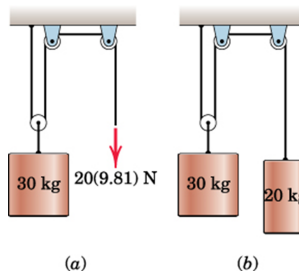


Figure 2: Illustration to Problem 2.

- P3.** (2 points) A force  $P$  is applied to the initially stationary cart. Determine the velocity and displacement at time  $t = 5\text{s}$  for each of the force histories  $P = P_1(t)$  and  $P = P_2(t)$ . Neglect friction.

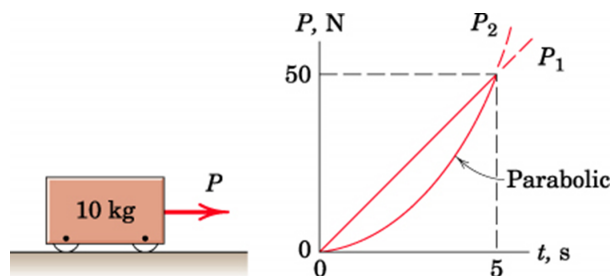


Figure 3: Illustration to Problem 3.

- P4.** (3 points) A small box is deposited by the conveyor belt onto the  $30^\circ$  ramp at  $A$  with velocity  $0.8\text{ m/s}$ . Calculate the distance  $s$  on the level surface  $BC$  at which the package comes to rest. The coefficient of kinetic friction for the box and supporting surface from  $A$  to  $C$  is  $0.3$

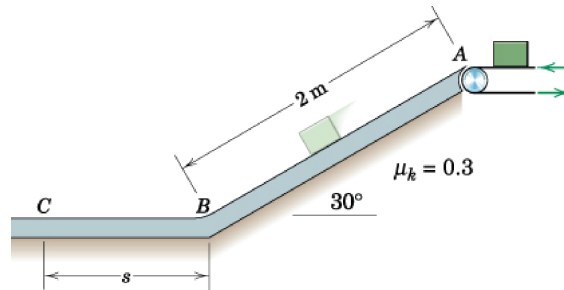


Figure 4: Illustration to Problem 4.