Physics 160 Written Homework - Chapter 5.

1 Frictional Forces

Block A is sitting on top of Block B, which sits on a table. There is a massless rope attached to the right side of A that runs through a frictionless, massless pulley and then returns to attach to the right side of B. Block A has a mass of $3kg$, and Block B has a mass of $8kg$. If $\mu_s = .6$ and $\mu_k = .4$ between the blocks and between the block and the table:

(Refer to Figure P5.89 in the book for a picture.)

a. If a force is applied to Block B to the left, find its maximum value such that the blocks do not move.

b. If the force applied is greater than this maximum value by $3N$, find the rate at which the blocks accelerate.

2 Circular Motion

A boy wants to take his race car around a vertical circular loop in his race track without it falling off. If the car weighs $150g$ and the radius of the loop is $8cm$, calculate the minimum constant speed that the car needs to travel so it doesn't fall off the track.

(Assume the loop is a perfect circle, even though normal loops have a horizontal component. You can refer to figure E5.42 for a picture.)