MIT Department of Physics

Physics 8.01L Fall 2009

PROBLEM SET #5
Due Friday 18th October 9am

READING: Young and Freedman Chapter 5 (entire).

FORMAT: Please read the instructions on the web page concerning the required format for problem sets.

5-1) Young and Freedman, exercise 5.37 page 171.

5-2) Young and Freedman, exercise 5.41, page 171. Please use m_A, m_B, μ_k and d rather than the numerical values given and solve algebraically.

5-3) Young and Freedman, exercise 5.50, page 172. Please use R and v instead of the numerical values given and solve algebraically.

5-4) Young and Freedman, exercise 5.52, page 172. Please use R, ℓ and θ instead of the numerical values given and solve algebraically.

5-5) Young and Freedman, exercise 5.64, page 173.

5-6) Young and Freedman, exercise 5.65, page 173.

5-7) Young and Freedman, exercise 5.88, page 176. Please use m_A, m_B and μ_k rather than the numerical values given and solve algebraically.

5-8) Young and Freedman, exercise 5.95, page 177. Please use R, v_0 and $1.5v_0$ rather than the numerical values given and solve algebraically.

5-9) Look at figure 5.60 in Young and Freedman. Instead of a force $\vec{F}$, let there be a weight W, and suppose that it is accelerating. Find its acceleration in terms of w, W and g. *Note:* When you count unknowns and equations, you will find you need a constraint. The constraint here is *tricky!* Contrast the result with the result for Atwood's machine.