

**Reading:**

In this past week we have worked with HRW Chapter 10 (on rotation)

New material for this week will be in Chapter 11 (more rotation). It is likely that we will move on to Chapter 12 and 13 (which will be quick) before discussing static fluids, the topic of Chapter 14

**Problems:**

*Due in class Friday, November 1.*

- (1) HRW Chapter 9 Problem 3
- (2) HRW Chapter 9 Problem 13
- (3) HRW Chapter 9 Problem 16
- (4) HRW Chapter 9 Problem 24
- (5) HRW Chapter 9 Problem 34
- (6) HRW Chapter 9 Problem 69 (as we saw in class)
- (7) HRW Chapter 9 Problem 77
- (8) An intrepid Hamilton physics student takes off on a rocket bicycle of powered by a fire extinguisher. Starting from rest the student fires the extinguisher and reaches a final speed of 4.03 m/s. The initial mass of student gas and bike is 122 kg and the final mass is 118 kg. Find the exhaust speed of the gas escaping the fire extinguisher.
- (9) HRW Chapter 9 Problem 123
- (10) HRW Chapter 10 Problem 3
- (11) HRW Chapter 10 Problem 13
- (12) **Optional Bonus** (worth 1 point) Following up on our discussion in class: Consider  $N$  balls in a vertical stack numbered from the bottom up such that  $m_1 \gg m_2 \gg \dots \gg m_N$ . Suppose that the stack is dropped from a height  $h = 1.0$  m. What is the number  $N$  required for the lightest and topmost ball to reach the escape velocity of Earth,  $v_{esc} = \sqrt{2GM_e/R_e}$ ? Assume that the collisions are elastic and that wind resistance is negligible.