

PS #5 121 Due Monday in class Schwartz

- 1) Section 4.1 Example 1, Rotation Direction
- 2) Section 4.2 Exercise 1, Rotation and kinetic energy of two masses
- 3) Section 4.2 Exercise 2, Rotation and linear speed, bicycle problem
- 4) Section 4.3 Exercise 2, Turning a wrench
- 5) Section 4.3 Exercise 4, Pedaling a bicycle
- 6) Section 4.4 Exercise 2, Kinetic energy of two masses
- 7) Your friend has a round-bottom swimming pool that they are cleaning, so it is empty! The pool is 4 m deep, so you and your friend (who has the same mass as you) drop in on your skateboards simultaneously from opposite sides, but your friend only drops from 2 m. You meet in the middle and hang onto each other.
  - a) After you hit each other at the bottom, are the two of you at rest? If so, explain how you know.
  - b) If not, please *estimate* the height you two roll up to before you come to a stop and start oscillating back and forth in the pool.
- 8) Two identical disks (“A” and “B”) are spinning in opposite directions in space, and  $\omega_A = \underline{3}\omega_B$ . They get slammed together and stick together. I am wondering if they are moving or not in the end. You have to help me find out.
  - a) Which lens would you use and why?
  - b) *Briefly* describe in 1 sentence the linear physics problem that is analogous to this
  - c) Is there any thermal energy given off? How do you know?
  - d) Calculate the thermal energy given off in terms of  $\omega_B$ , and  $I$ , their moment of inertia.

What's your name? \_\_\_\_\_