Total: 20 points

Homework 2.2

(2) **E.21** Skidding sideways does work against sliding friction, converting some of the skier's kinetic energy into thermal energy.

(2) **E.22 There is (sliding) friction which is opposing the motion. Sliding friction results in objects heating up, thus, the energy goes into thermal energy (disordered energy).**

(2) **E.24** (see E.22) During sliding friction work is done (wear) on the surfaces), and the work is turned into thermal energy. Thus, the work done by the sprinter is not all turned into kinetic energy, but also into thermal energy.

(2) **E.26** Friction is always an action-reaction pair. Thus, when you turn the wheel (by pedaling), the wheel is pushing backward on the road (rolling; static friction); and the road is pushing forward on the wheel (and on you).

(2) **E.27** A static frictional force from the pavement pushes you forward.

(2) **E.29 Putting sand in the trunk, increases the weight of the car, pushing the wheels harder on the road.** Pressing the wheels more tightly against the pavement increases the maximum force that static friction can exert on the wheels.

(2) **E.31** The chalk experiences sliding friction as you write and leaves visible wear chips on the blackboard.

P. 7 $K = \frac{1}{2} I \omega^2$

(2) if I were 5x smaller, but ω 5x larger, the kinetic energy, K, would be 5x larger (because ω is squared)

P. 11 $K = \frac{1}{2} m v^2$

$K = \frac{1}{2} 800\,kg \cdot \left(3 \frac{m}{s}\right)^2$

(2)

$K = 3600\ J$

P. 16 $E_{grav.} = m \cdot g \cdot h$

$= weight \cdot h$

$\rightarrow weight = \frac{E_{grav.}}{h}$

(2)

$weight = \frac{10,000\ J}{5\ m}$

$weight = 2,000\ N$ //