Wednesday Reading Assessment: Unit 7, Power and Conservation of Energy

Prof. Jordan C. Hanson

November 6, 2019

1 Memory Bank

- $W = \vec{F} \cdot \Delta\vec{x}$ ... Definition of work, Joules.
- $P = dW/dt$ ... Definition of power, Watts.
- $U = mg\Delta y$ ... Gravitational potential energy.

2 Work and Power

1. An 80-kg army trainee does 10 pull-ups in 10 seconds. Assume the trainee raises his center of mass by $\Delta t = 0.6$ meters. How much average power do the trainees muscles supply moving his body?

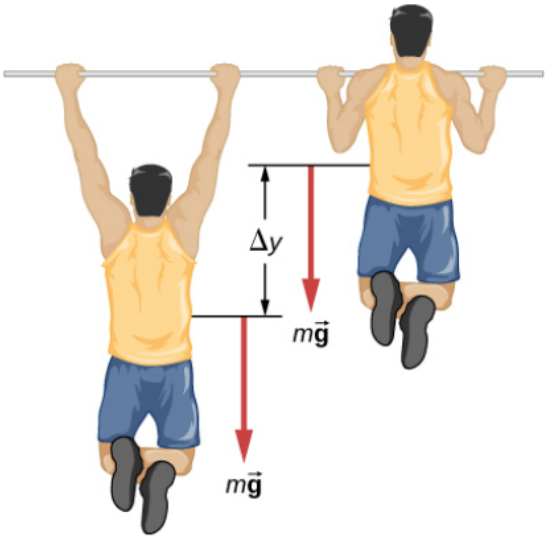

Figure 1: An army trainee does pullups at a certain rate.

2. The unit of *horsepower* is sometimes used to describe engines. One horsepower is equal to 746 Watts. (a) How many Watts can a 200 horsepower engine produce? (b) Another engine provides 3×10^6 J of work in 1 hour. How many horsepower does it have?