5.5 Review Questions

1. A 55 Kg person goes up a 25 m high hill and coasts down.
   - a. How much work did he have to do to get to the top?
   - b. What was his PE at the top?
   - c. What was his KE at the top?

While coasting down the hill,
   - d. What was his PE halfway down?
   - e. What was his KE halfway down?
   - f. What was his PE at the bottom of the hill?
   - g. What was his KE at the bottom of the hill?
   - h. How fast was he going at the bottom of the hill?

2. A rescue worker in the White Mountains with a mass of 60 kg needs to get up a 100 m hill in the winter to save a stranded climber. She can either climb straight up a frozen waterfall using ice axes and crampons or she can use a 250 m path and walk to the top.
   - a. How much work must she do to get up the mountain via the waterfall?
   - b. How much work must she do to get up the mountain via the path?
   - c. What is her PE at the top?
   - d. What force did she have to apply if she goes up the rope?
   - e. What force does she have to apply if she went up the path?
   - f. If you were the rescue worker, which way would you go up and why?

3. You are in a sledding competition in your home town. Your mass is 65 kg and the hill is 20 m tall. (assume energy is not lost and there is no friction)
    a. What is your PE at the top? At the bottom?
    b. What is your KE at the bottom? At the top?

4. A person is pedaling up a 25.0 m hill on her bike. She and the bike weigh 550 N together. She has a choice of three paths to get up the hill. She can go straight up the side (Path A) carrying her bike. Path A is 25 m long. She can go up Path B, which is 50 m long. Or she can go up Path C, which is 100 m long.
    a. How much work must she do if she takes Path A?
    b. How much work must she do if she takes Path B?
    c. How much work must she do if she takes Path C?
    d. What is her PE at the top of the hill?
    e. What force did she have to apply using Path A?
    f. What force did she have to apply using Path B?
    g. What force did she have to apply using Path C?
    h. What is her KE at the top?

For questions i-q she is coasting down the hill.
    i. What is her PE 1/2 the way down the hill?
    j. What is her KE 1/2 the way down the hill?
    k. What is her PE 1/5 the way down the hill?
    l. What is her KE 1/5 the way down the hill?
    m. What is her PE 4/5 the way down the hill?
    n. What is her KE 4/5 the way down the hill?
    o. What is her PE at the bottom of the hill?
    p. What is her KE at the bottom of the hill?
    q. How fast is she going 4/5 the way down the hill?