Planet Holloway **websheet 5.3**
AP Physics C - Chapter 5
You may print this out and write on it or work on your own paper.
Show all work.

1. A professional tobogganer reaches a speed of 27 m/s on a frictionless ski hill of 40°. What is the minimum distance the tobogganer traveled if he started at 1.5 m/s?

2. A tortoise (12 kg) is walking at 1 m/s. If the tortoise is scared by an evil biologist who places a 12 kg bag of sand on the back of the tortoise causing him to accelerate in a state of panic up to 3 m/s, what happened to the tortoise's kinetic energy?

3. A 1.2 m pendulum is released from 28° from vertical. What is the speed of the bob at the bottom of the swing? If the bob has a mass of 1.4 kg, how much work is done by gravity? How much work is done by the string?

4. A 3 kg block is placed on a spring and allowed to come to rest. The spring depresses by 15 cm. If the spring is mounted horizontally and the block is forced to compress the spring by 20 cm and then released, what speed does the block leave the spring horizontally?

5. Three identical blocks are thrown off of building 4 at 14 m/s. Block A is thrown up at 75°, block B is thrown horizontally and block C is thrown down at 60° below horizontal. List the blocks in order by time in the air (from greatest to least). List the blocks in order by final kinetic energy. List the blocks in order by work due to gravity.

6. A 2 kg block is at rest on the top of a 20 m long rough ramp inclined at 20° with a coefficient of kinetic friction of 0.6. If an albino Alabaman accordion player does 40 J of work on the block down the ramp over 12 nm, how far down the ramp does the block slide?

Answers:

4. 1.63 m/s

1. 56.5 m

5. time – A, B, C. K – A=B=C. W_g – A=B=C

2. Increased 18 times

3. 1.68 m/s, 1.97 J, None

6. 9.0 m