ENERGY PROBLEMS for you, to do, shoo be do bee do...

by_____

Let g = 9.80 m/s^2. Remember to round off answers appropriately.

1.1) A window washer on a scaffold 10.0 meters high kicks the bucket, so to speak, off the scaffold with a speed of 3.00 m/sec. How fast will the bucket be traveling when it hits the sidewalk below?

Ans:

1.2) A low and inside pitch on Opening Day hits the dirt behind home plate at 35 m/sec. If the ball was released from the pitcher's arm 2.5 meters above the level of the field, how fast did the pitcher throw the ball?

Ans:

1.3) You throw something at 5.0 m/sec, and it hits the ground at 8.0 m/sec. How far above ground level are you?

Ans:

2.1) A hockey puck of mass 0.160 kg is zipping along at 5 m/sec. It enters a 10.0 m long stretch of rough ice and leaves it at 3.00 m/sec. What average friction force did the ice exert?

Ans:

2.2) So, here you are on the way to pick up your date for prom, and the car runs out of gas! (You knew you'd forgotten *something!*) Your 1000.0 kg car is moving at 15.0 m/sec at the moment, and a backward force of 200.0 N acts on the car. How far will it coast before it stops?

Ans:

2.3) Ixnorx the alien astronaut is traveling in deep space at what would be, in mere earthling terms, 1000.0 m/sec in his ship with a mass of 12,000.0 kg. He fires his booster rocket, exerting a force of 20,000.0 N, for a distance of 10,000.0 m. How fast is he going now?

Ans:

3.1) A 0.0500 kg pine cone falls from a high branch 20.0 meters above the forest floor and bonks a lazy skunk on the head at 4.00 m/s. What average resistive force did the branches generate on the way down?

Ans:

3.2) A mild earthquake shakes a 500.0 kg boulder loose from the top of a hill. It rumbles 2500.0 meters down the slope and comes to rest at a level 800.0 meters below its starting level. What average resistive force did the stone experience on the way down?

Ans:

3.3) Let's imagine that a bullet with a mass of 5.00 grams leaves a rifle at 400.0 m/s and experiences an average resitive force of 0.00100 N. How high can the bullet rise if fired straight up?

Ans: