A X kg toy train engine coasts forward at V until it hits a Y kg train car that is at rest. What is their velocity after they hook together?

(X\*V)/(X+Y)

A X kg rock is dropped from a cliff. It reached a final velocity of V just before it hit the ground. How tall is the cliff?

gh = 1/2v^2

How much energy does a machine that needs a W watts for T seconds use?

Joules = watts \* seconds

A X kg bungee jumper drops off a high bridge. If she falls a total distance of H meters, what PE

PE = mgh

A child pulls with a force of N newtons on a rope angled at O degrees up from the horizontal, to drag a X kg sled through the snow at V for T. Work?

fdcosO = N \* V \* T \* cosO

An amusement park ride has a spring with a constant of X N/m. If it is stretched Y meters, energy?

1/2kx^2

What is the kinetic energy of a X kg cart going V mps?

1/2mv^2

If a X kg pendulum on a Y meter long wire is released from an angle of O degrees, what is the maximum velocity of the pendulum as it swings back and forth?

Mgh = 1/2mv^2

mg(L-LcosO) = 1/2mv^2

g(L-LcosO) = 1/2v^2

Two carts on an air track collide and stick together. The first cart has a mass of X is moving V to the right. The second cart has a mass of Y grams and is moving W m/s to the right. Velocity?

XV - YW = (X+Y) Vf

An elevator uses J joules to lift several people X meters up to a higher floor. What is the total mass in kg of the people and elevator combined?

J / (X\*10)

A spring (K = X) has J joules of potential energy stored in it. How far is the spring being stretched or compressed?

J = -1/2kx^2

A X kg boxcar going v hits another car that is at rest. After they collide, the two cars hook together and move at vf m/s. Mass of the second car?

X \* v = (X + m) vf