

Name: _____

Class Period: _____

Honors Physics:
Work-Energy Theorem: Homework

What is the work energy theorem? Write the different variations of this formula below:

1. A 30.0 kg go-cart skids to a stop as a force of friction slows the cart's motion. The go-cart started with an initial velocity of 18.0 m/s and stopped in a distance of 25.0 m.
 - A. Draw the FBD and indicate the direction of motion
 - B. Which force(s) are able to do work?
 - C. What is the force of friction between the tires and road, bringing the go-cart to a stop?

2. A force of 60.0 N is used to accelerate a mass of 1.00 kg from rest through a horizontal distance of 12.0 m. A force of friction opposes the motion. The coefficient of kinetic friction is 0.30.
 - A. Draw a FBD and indicate the direction of movement
 - B. Calculate the net work done by the forces that can contribute work to this system.
 - C. What is the final velocity of the mass through the given distance?

3. A car with a mass of 2.10×10^3 kg starts from rest from the top of a sloped driveway (angle of incline = 20.0°) and heads downward. A frictional force of 4.00×10^3 N opposes the motion of the car so that the car's velocity at the bottom of the driveway is only 3.80 m/s.
- A. Draw a FBD and indicate the direction of movement.
 - B. Calculate the total amount of force that can contribute work to this system.
 - C. What is the distance or length of the driveway?

4. ***Combination Problem: Work, Power, and Energy**

A shot-putter accelerates a 7.30 kg shot from rest to 14.0 m/s. If this motion takes 2.00 s, how much power was developed?