Work Notes

1. A mass of 4 kg is initially at rest. A force of 98 Newtons is applied to the mass in the direction of a displacement during 46 meters of travel. Assume no friction. What is the final velocity of the mass in m/s?

2. A mass of 5 kg has an initial velocity of 26 m/s. A constant friction force of 38 Newtons is applied to the mass in the opposite direction of its displacement. What will be the displacement magnitude in meters of the mass once it comes to a stop?

3. A mass of 7 kg has an initial kinetic energy of 115 Joules. A force of 12 Newtons is applied to the mass in the direction of the velocity during a displacement of 12 meters. Assume no friction. What is the final velocity of the mass in m/s?

4. A mass of 6 kg is initially at rest at the bottom of a hill. A force of 14 Newtons is applied to the mass in the direction of displacement for 23 meters before the mass ascends the hill. Assume no friction and that g = 6 m/s/s. What is the maximum vertical height in meters reached by the mass as it travels up the hill?

5. A mass of 9 kg is at the top of a hill with height 36 meters. A force of 20 Newtons is applied to the mass in the direction of a displacement over 7 meters at the top of the hill. Assume no friction and that $g = 6$ m/s/s. What is the velocity of the mass in m/s at the bottom of the hill?

6. A spring applied a variable force on a toy car of mass 6 kg that was initially at rest. This variable force in Newtons was graphed against the displacement in meters for which the variable force was applied. The graphed curve created an area between itself and the x-axis of 12 N*m. Assume no friction. What was the final velocity of the toy car in m/s?

7. A shopper pushes a shopping cart to the right with 20 Newtons of force. The angle between the push force and displacement is 60 degrees. While the shopping cart travels a displacement of 11 meters, how much work is done by the shopper on the shopping cart? Assume the shopper does positive work on the shopping cart.

8. A shopper pushes a shopping cart to the right with 25 Newtons of force. The angle between the push force and the displacement is 60 degrees. Assume that the cart travels at a constant velocity and that friction does negative work on the shopping cart. While the shopping cart travels a displacement of 30 meters, how much work is done by the friction force on the shopping cart?