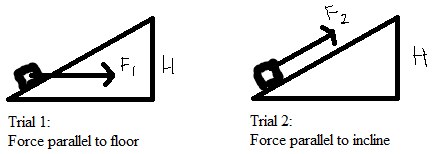
1. Two cars travel to the right, each starting from rest, along a straight road. Car A has twice the acceleration of Car B. After traveling a distance d, Car A has speed v. When Car B has traveled the same distance d, what is its speed in terms of v?
   1. **¼ v b. ½ v c. √3/2 v d. √2/2 v e. v**
2. An object moving only to the right completes a 20.0 second trip in two states, I and II. The average speed of the entire 20.0 second trip is 10.0m/s. For state I, the object moves with a constant velocity of 6.0m/s for 12.0 seconds. What constant acceleration must the object have during 8.0 seconds of state II?
   1. **2.25 m/s2 b. 2.50 m/s2 c. 4.00 m/s2 d. 6.25 m/s2 e. 8.50 m/s2**
3. At the top of a high cliff, a small rock is dropped from rest. A ball is launched straight downward with an initial speed of 36.0 m/s at a time 2.10s after the rock was dropped. When the ball has fallen 28.0m further than the initially dropped rock, what is the speed of the ball relative to the rock?
   1. **15.0 m/s b. 16.0 m/s c. 20.0 m/s d. 21.0 m/s e. 36.0m/s**
4. An object of mass M starts from rest at the bottom of a fixed incline of height H. A person decides to push the object up the incline in one of two ways with an applied force shown in the diagram. In each of the trials, the object reaches the top of the incline with speed V. How would the work done by the person on the block compare for the first two trials? Assume the same constant non-zero coefficient of kinetic friction between the incline and the object for both trial



* 1. **More work would be done in Trial 1**
  2. **More work would be done in Trial 2**
  3. **The work would be equal for both trials**
  4. **It is impossible to determine for which trial there would be more work done without knowing the value of the speed V**
  5. **It is impossible to determine for which trial there would be more work done without knowing the value of the coefficient of static friction**

1. A rubber ball of mass 2.0kg falling straight downward hits the ground with a speed of 0.90m/s and then rebounds straight upward with a speed of 0.60 m/s. The collision time of the ball with the ground is t = 0.25s. Treat g = 10 m/s2 for this situation.
2. What is the magnitude of the average acceleration in units of m/s2 of the ball while it is in contact with the ground?
   1. **1.2 b. 6.0 c. 10.0 d. 12.0 e. 16.0**
3. What is the magnitude of the average force in units of Newtons exerted by the ground on the ball while they are in contact?
   1. **2.4 b. 12.0 c. 20.0 d. 26.0 e. 32.0**
4. A 4.0kg object in deep space moves at a constant velocity of 10m/s along the positive x axis. The object suddenly explodes into 2 equal mass pieces. Immediately after the explosion, one piece is now moving directly along the negative y axis with a speed of 8.0m/s. What was the size of the impulse in proper MKS units provided to this piece now moving along the negative y axis from the explosion?
   1. **0.769 b. 0.592 c. 0.500 d. 0.447 e. 0.350**
5. A girl swings a 4.0kg mass with a constant speed of 3.24m/s in a vertically-oriented circle of radius 0.75m. What is the net force acting on the mass when it is at the lowest point of the circle?
   1. **96N b. 56N c. 40N d. 16N e. 0N**