College Physics 201 Mock Exam 1

Important equations:

v=v0+at

x-x0=v0t+1/2at2

v2=v02+2a(x-x0)

1. You wake up late for your Physics Exam and need to walk from Rast Hall to Heritage Hall in 12 minutes to arrive on time. You run out the door and walk north on 16th street for 100 meters, turn west and run 0.186 miles down 10th Ave S, and finally turn Northeast at an angle of 21.3 degrees (measured from North) to run another 0.217 miles to arrive at Campbell Hall. Use an x-y coordinate system where North is in the positive y direction, and East is in the positive x direction. (1 mile=1.609 kilometers).
   1. What is the total distance traveled in kilometers?
   2. What was the average speed traveled throughout the trip if you arrived exactly on time?
   3. What is the total displacement traveled in kilometers?
2. You throw a baseball up into the air. It reaches the peak of its path in 7.4 seconds, then lands on a hill 67 meters higher from where you were standing.
   1. What is the maximum height the ball reaches?
   2. How long does it take the ball to hit the ground after it is released?
3. Two cars are racing on a straight track. Car 1 is driving at a constant velocity of 148 MPH. Car 2 is driving at a constant velocity of 163 MPH. Car 2 is 0.24 miles behind Car 1. Car 1 wins the race. What is the maximum possible distance the finish line can be from Car 1, in meters, for this to be true? (1 mile=1.609 kilometers)
4. A javelin thrower throws a javelin with an initial velocity of 43 m/s at an angle of 40 degrees with respect to the horizontal. How far does the javelin travel, and how long does it take the javelin to hit the ground?
5. A plane traveling at 340 m/s drops a package which lands 4,563 meters away in the x direction. How high was the plane flying?
6. The following system is in equilibrium. Block 2 has a mass of 17kg. The ramp sits at an angle of 30 degrees. What is the mass of block 1? Friction is negligible.

Pulley

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1. The following system is in equilibrium. The coefficient of static friction is 0.25. If the mass of block 1 is 62 kg, and the mass of block 2 is 70 kg, find the largest possible mass for block 3.

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1. A block of mass 20 kg is resting on a surface with a coefficient of static friction 0.40.
   1. How much force is required to make the box begin moving?
   2. If the coefficient of kinetic friction is 0.25, then what is the acceleration of the block if it was being pulled with a forced of 100N?