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Name: _____

Physics 50
Spring 2013
Exam 1

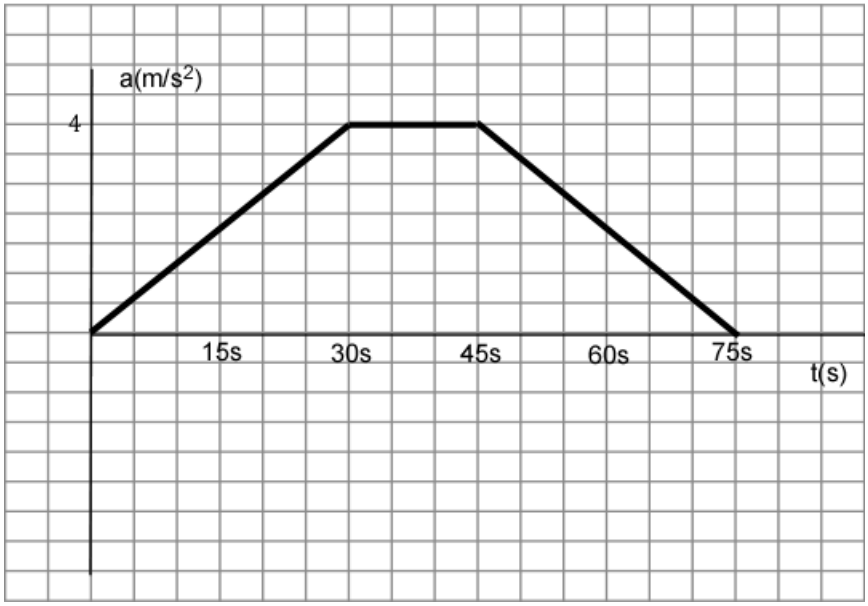
MAKE SURE TO SHOW ALL WORK IN COMPLETE DETAIL. NO CREDIT WILL BE GIVEN IF NO WORK IS SHOWN. EXPRESS ALL ANSWERS IN SI UNITS.

1. A speeding motorist zooms through at 75 km/h, without noticing a police car by the roadside. The police car immediately begins to chase the speeding motorist with an acceleration of 7.0 m/s^2. (15 pts)
    a) Calculate the time it takes the police car to catch speeding motorist.
    b) Calculate how far the police car has to travel to catch speeding motorist.
    c) Calculate the speed of the police car when it catches the speeding motorist.

2. A stone is dropped into a river from a bridge 43.9 m above the water. Another stone is thrown vertically down 1.0 s after the first stone is dropped. The stones strike the water at the same time. (15 pts)
    a) Calculate the initial speed of the second stone.
    b) Calculate the speed of the first stone when it strikes the water.
    c) Draw a graph of y vs. t and V vs. t for the motion of the second stone and label all pertinent information.

3. A particle moves along a straight line with an acceleration given by the graph below. If at t = 0s, the velocity of the particle is 10 m/s, (10 pts)

   a) Calculate the velocity at t = 30 s.
   b) Calculate the velocity at t = 75 s.



4. Astronauts on a distant planet throw a rock straight upward and record its motion given by the following graph. (10 pts)
    a) Calculate the initial speed of the rock.
    b) Calculate the acceleration of gravity on this planet.