Additional Problems

1) Two balls are separated from each other by a distance of 1m. They are released (yes, we are not done with this problem yet!) simultaneously i.e. the clock near each ball reads zero when they start their motion and the two clocks are synchronized. Ball A to the left has an initial velocity of 2m/s and an acceleration of -1m/s$^2$. Ball B is released from rest and is subjected to the same acceleration i.e. -1m/s$^2$.

a) Choose an origin and coordinate axes for analyzing this problem (only one origin, please!).

b) Make a table of final position $x_f$, final velocity $v_f$ for every 0.5 second starting from $t = 0s$.

c) Graph position vs. time for both balls.

d) Will the balls cross each other at a position such that $0 < x < 0.5$, $x = 0.5$ or $x > 0.5$m?

2) An object is launched with an initial velocity of 50m/s at a launch angle of 36.90$^\circ$ above the horizontal.

a) Make a table showing the values of $x$, $y$, $v_x$, $v_y$ and the speed $v$ every 1s from $t = 0$ to $t = 6s$.

b) Plot a graph of the trajectory during the first 6s of motion.