Math 166 - Group Project 1

Driving the bus.

Instructions: Starting from a bus stop in Ames, a bus travels $12\frac{2}{3}$ miles to a stop in Nevada, and then travels $8\frac{2}{3}$ miles to a stop in Colo. The trip from Ames to Nevada takes 23 minutes, while the trip from Nevada to Colo takes 17 minutes. The stop in Nevada lasts for 3 minutes. After each stop, the bus accelerates at a constant a_1 miles/minute^2 until it reaches its cruising speed of v_0 miles/minute. It continues at this constant speed until it is time to decelerate at a constant a_2 miles/minute^2 to a stop.

Answer the following questions. For full credit you must clearly show all work. On your graphs clearly label all important (or interesting) points and where possible, give the slope of any line segments.

a. On the set of axes provided (check the axes labels), draw a graph of the velocity as a function of time for the 43 minutes of the trip.

b. Let $d(t)$ be the distance from Ames at time t. On the set of axes provided (check the axes labels), draw a graph of $d(t)$ as a function of t for the 43 minute trip.

c. Calculate v_0. Be sure to show all work and *describe* (in words) your reasoning.

d. Assume that a_1 and a_2 are both equal to the same number a. Find a. Be sure to show all work and *describe* (in words) your reasoning.

Each group should turn in a separate page for each of the graphs in parts a. and b., and work and answers for parts c. and d. Make sure that the names of all group members are on each page turned in.