Homework #4

Due Oct. 4

1. A car is moving with constant velocity along a straight road. At 12:32 PM it passes mile marker reading 14 mi. At 1:43 PM it passes a mile marker reading 81 mi.

(a) How fast is the car going?

(b) Where will the car be at 2:00 PM?

2. A jogger is initially at rest, then starts running forward at a constant speed. The jogger then slows down and stops, rests for a moment, and then runs back toward the initial starting point, this time with a constant speed that is slower than she did on the way out. She stops before she gets all the way back to the starting point. Assume the jogger is always moving in a straight line, which we take to be along the x axis.

(a) Sketch a plot of x *vs.* t for this motion. Indicate the portion of your plot where the jogger is at rest.

(b) Sketch a plot of v *vs.* t for this motion. Indicate the portion of your plot where the jogger is at rest.

3. A stone is dropped from rest from a tower, and accelerates downward with a constant acceleration of 9.8 $\mathrm{m/s^2}$.

(a) Plot the position of the stone as a function of time for the first 4 s of its motion. Do this by hand on graph paper.

(b) Plot the velocity of the stone as a function of time for the first 4 s of its motion. Do this by hand on graph paper.

(c) Draw a picture of the tower on graph paper, indicating the scale of your drawing. Make sure the tower is high enough that the stone does not reach the ground in 4 s. Sketch a person next to the tower, drawn approximately to scale. Indicate the position of the stone every 0.25 s, starting from when it was dropped.