9. (15 pts) The tortoise, the hare, and the rhinoceros begin a 9-mile race at $t = 0$ hours. Remarkably, a 3-way tie results – it takes each competitor exactly 2 hours to finish.

The tortoise's style is slow and steady. He runs the entire race without speeding up or slowing down at all. The hare's style is more erratic: He runs half of the race in the first 20 minutes, stops for a long tea, then runs the second half in the last 20 minutes. The rhino, an amateur mathematician, runs so that her position $R(t)$ in miles from the starting line is always exactly $4.5t^{3-t}$.

a) What is the average velocity on the time-interval $[0, 2]$ of...

   i) ...the tortoise?

   ii) ...the hare?

   iii) ...the rhinoceros?

b) What is the instantaneous velocity of the tortoise at time $t = 1$?

c) What is the instantaneous velocity of the hare at time $t = 1$?

d) Estimate the instantaneous velocity of the rhinoceros at time $t = 1$. (Show your work. "I used my calculator" is *not* sufficient work.)

e) Imagine that you are a radio reporter describing the events as you see them at time $t = 1$. Tell your audience the status of the race. For example, is anyone passing anyone else?