Physics 120 Homework
Problem 1.P.97
SL

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a. The average velocity is given from the position update formula:
$$\vec{r}_f = \vec{r}_i + \vec{v}_{avg}\Delta t \rightarrow \vec{v}_{avg} = \frac{\vec{r}_f - \vec{r}_i}{\Delta t} = \frac{\langle 22.3, 26.1, 0 \rangle m - \langle 0,0,0 \rangle m}{1s - 0s} = \langle 22.3, 26.1, 0 \rangle \tfrac{m}{s}.$$

b. The location of the ball is given by
$$\vec{r}_f = \vec{r}_i + \vec{v}_{avg}\Delta t = \langle 22.3, 26.1, 0 \rangle m + \langle 22.3, 26.1, 0 \rangle \tfrac{m}{s} \times 1s = \langle 44.6, 52.2, 0 \rangle m.$$

c. Given that the ball is at the actual position of $\vec{r}_f = \langle 40.1, 38.1, 0 \rangle m$ we have over estimated the actual position by quite a bit since the average velocity in part a, is probably not constant as the ball moves.