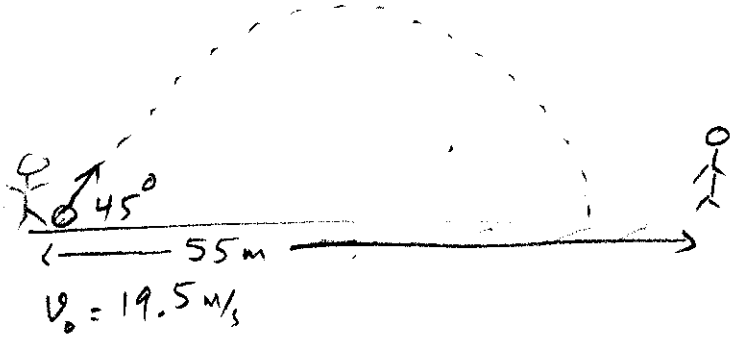
#36 P

$$\vec{V}_{avg} = \frac{\vec{r}_2 - \vec{r}_1}{t}$$

$\vec{r}_1 = 55\,\hat{i}$

Need $\vec{r}_2$ & t



Notice that $\Delta y = 0$

$$\Rightarrow \Delta y = (v_0 \sin\theta_0)\,t - \frac{1}{2} g t^2$$

$$0 = (19.5 \sin 45)\,t - \frac{1}{2} \times 9.8\, t^2$$

$$\Rightarrow 0 = 13.8\,t - 4.9\,t^2$$

$$\Rightarrow t(4.9t - 13.8) = 0$$

$$t = \frac{13.8}{4.9} = 2.81\ s$$

$$r_2 = \Delta x = (v_0 \cos\theta_0)\,t = 19.5 \times \cos 45 \times 2.81 = 38.3\ m$$

$$\Rightarrow \vec{r}_2 = 38.3\,\hat{i}$$

$$\Rightarrow \vec{V}_{avg} = \frac{38.3\,\hat{i} - 55\,\hat{i}}{2.81} = -5.9\,\hat{i}$$