

Chapter 7Problem 88

$$\vec{F}_1 = 2y \hat{i} + 3x \hat{j}$$

Find the work done by this force as the particle moves to a point 5 meters to the right, along the x-axis.

Starting at the origin and ending at  $5 \hat{i} \text{ m}$ .

$$\text{So } d\vec{r} = dx \hat{i} \quad \begin{array}{l} \vec{r}_0 = 0 \\ \vec{r}_f = 5 \hat{i} \text{ m} \end{array}$$

$$\begin{aligned} W &= \int_{\vec{r}_0}^{\vec{r}_f} \vec{F}_1 \cdot d\vec{r} \\ &= \int_{\vec{r}_0}^{\vec{r}_f} (2y \hat{i} + 3x \hat{j}) \cdot dx \hat{i} \\ &= \int_{\vec{r}_0}^{\vec{r}_f} 2y dx \end{aligned}$$

since  $y=0$  during the path, the work is

$$W = 0 \text{ J}$$