## Section 3.4 Problems

Text: 157, 163, 173, 174-177 (present as one problem), 181
Additional problems:

1. Find the position $\mathbf{r}(t)$ and velocity $\mathbf{v}(t)$ vectors of a particle with acceleration

$$
\mathbf{a}(t)=2 \mathbf{i}+4 t \mathbf{j}
$$

and initial position and velocity

$$
\mathbf{v}(0)=3 \mathbf{i}-\mathbf{j}, \quad \mathbf{r}(0)=\mathbf{j}+\mathbf{k} .
$$

2. The position of a particle is given by

$$
\mathbf{r}(t)=\left\langle t^{2}, 5 t, t^{2}-16 t\right\rangle
$$

Determine the time $t$ where the speed of the particle is minimized.

