7. To emphasize the fact that the velocity is a function of time, we adopt the notation $v(t)$ for $\frac{dx}{dt}$.

(a) Eq. 4-10 leads to

$$v(t) = \frac{d}{dt}\left(3.00t\,\hat{\mathrm{i}} - 4.00t^2\,\hat{\mathrm{j}} + 2.00\,\hat{\mathrm{k}}\right) = 3.00\,\hat{\mathrm{i}} - 8.00t\,\hat{\mathrm{j}}$$

in meters-per-second.

(b) Evaluating this result at $t = 2$ s produces $\vec{v} = 3.0\,\hat{\mathrm{i}} - 16.0\,\hat{\mathrm{j}}$ m/s.

(c) The speed at $t = 2$ s is $v = |\vec{v}| = \sqrt{3^2 + (-16)^2} = 16.3$ m/s.

(d) And the angle of $\vec{v}$ at that moment is one of the possibilities

$$\tan^{-1}\left(\frac{-16}{3}\right) = -79.4^\circ \quad \text{or} \quad 101^\circ$$

where we choose the first possibility (79.4° measured clockwise from the $+x$ direction, or 281° counterclockwise from $+x$) since the signs of the components imply the vector is in the fourth quadrant.