Appendix K.1: Additional Problems

1. The vector function, $\mathbf{r}(t)$, represents the position of a particle. Find the velocity and the speed of the particle at $t = 3$.

$\mathbf{r}(t) = \left\langle \sqrt{t^2 + 7}, t \right\rangle$

2. At what point does these curves intersect? What is the angle between the tangent vectors at the point of intersection?

$\mathbf{r_1}(t) = \left\langle 1 - t, 3 + t^2 \right\rangle$
$\mathbf{r_2}(s) = \left\langle s - 2, s^2 \right\rangle$