

### 3.7-Derivatives of Vector Functions

Recall definition:

What the derivative of a vector function tells us:

Acceleration vector-

*Examples:*

Find the velocity, speed, and acceleration for the curve  $\mathbf{r}(t) = \langle 4 \sin t, 4 \cos t \rangle$  at the point  $(2, -2\sqrt{3})$ .

Find a unit tangent vector for the curve  $\mathbf{r}(t) = \langle t \cos 2t, t \sin 2t \rangle$  at the point where  $t = \pi$ .

The graphs of  $\mathbf{r}(t) = t^2\mathbf{i} + t^3\mathbf{j}$  and  $\mathbf{r}(t) = \langle \sqrt{2} \cos t, \sqrt{2} \sin t \rangle$  intersect at the point  $(1,1)$ . Find the angle of intersection to the nearest degree.

**On Your Own:** 3.7 #2,3,7,8,10,12,14,16,18,19; 3.8 #41,44,46,48,51,52 (more to come...)