

## 1 3.7: Derivatives of Vector Functions

Recall definition:

What the derivative of a vector function tells us:

**Examples:**

Find the velocity and speed if the position function is given by  $\mathbf{r}(t) = (5 \cos t)\mathbf{i} + (5 \sin t)\mathbf{j}$  at the point  $(-3, 4)$ .

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

(On your own): Find parametric equations of the line tangent to the curve  $\mathbf{r}(t) = (t^3 - t + 1)\mathbf{i} + (t^2 + t + 1)\mathbf{j}$  at the point where  $t = 1$ .

$$(x = 1 + 2t, y = 3 + 3t)$$