MATH 231: Calculus of Several Variables
Section 1, 107 Ag Sc & Ind Bldg,
TR 9:05 AM - 9:55 AM

Homework 9: Due Thursday, Oct 3

1. Read the notes titled "Derivatives and Integrals of Vector Functions"
2. Find the derivative of the following vector functions
   (a) $\vec{r}(t) = \langle 0, 1, t \rangle$
   (b) $\vec{r}(t) = \langle \tan 2t, \sec 3t, 4/t^2 \rangle$
   (c) $\vec{r}(t) = \left\langle e^{2t^2}, -2, \ln(5t-2) \right\rangle$
3. Find the integral of the following vector functions
   (a) $\vec{r}(t) = \langle 0, 1, t \rangle$
   (b) $\vec{r}(t) = \langle \tan t, \sec 3t, 4/t^2 \rangle$
4. Sketch the curve and draw its tangent vector at $t = 1$. Be sure to clearly label the vector.
$$\vec{r}(t) = \left\langle t, t^3 \right\rangle$$
5. For the vector function $\vec{r}(t) = \langle t, t^2, t^3 \rangle$, find
   (a) $\vec{r}'(t)$
   (b) $\vec{r}''(t)$
   (c) $\vec{r}'(t) \times \vec{r}''(t)$
   (d) $\vec{r}'(t) \cdot \vec{r}''(t)$