

Math 224

Quiz 6

Name: _____

February 6, 2004

Show all work for credit.

1. Find $\mathbf{r}'(t)$

(a) $\mathbf{r}(t) = \langle \cos 3t, t, \sin 3t \rangle$

(b) $\mathbf{r}(t) = e^{2t} \cos t \mathbf{i} + e^{2t} \sin t \mathbf{j} + e^{2t} \mathbf{k}$, at $t = \pi/2$

2. Evaluate the integral: $\int_0^{\pi/4} (\cos 2t \mathbf{i} + \sin 2t \mathbf{j} + t \sin t \mathbf{k}) dt$

3. (Bonus) Prove $\frac{d}{dt} [\mathbf{u}(t) \cdot \mathbf{v}(t)] = \mathbf{u}'(t) \cdot \mathbf{v}(t) + \mathbf{u}(t) \cdot \mathbf{v}'(t)$