

GEORGIA TECH

SCHOOL OF MATHEMATICS

MATH 2401

CALCULUS III

Quiz # 2

September 6th, 2012

First Name : _____

Last Name : _____

1. Compute the length ℓ of the curve $\vec{r}(t) = t^3/3 \vec{i} + t^2/2 \vec{j}$ from $t = 0$ to $t = \sqrt{3}$

$$\ell =$$

2. Let $\vec{r}(t) = a \cos(\omega t) \vec{i} + b \sin(\omega t) \vec{j} + c \sin(2\omega t)$. If $a^2 - b^2 > 16c^2$, for which times T is the speed minimal?

(Hint : the solution is not unique !! Express all of them)

$$T =$$

3. (i) find the curvature κ and (ii) express the tangential component a_T and the normal component a_N of the acceleration for the curve $\vec{r}(t) = e^t \cos t \vec{i} + e^t \sin t \vec{j} + e^t \vec{k}$, **as a function of the time t**

$$\kappa =$$

$$a_T(t) =$$

$$a_N(t) =$$