Quiz 2

1) Evaluate the given integral.

$\int \vec{r}\,(t)dt$ where $\vec{r}(t) = t^3\,\vec{i} - \frac{2t}{t^2+1}\,\vec{j} + \cos(3t)\vec{k}$

(5 points)

2) Determine the length of $\vec{r}(t) = \langle \frac{1}{3}t^3,\ 4t,\ \sqrt{2}\,t^2 \rangle$ for $0 \le t \le 2$

(6 points)

3) Determine the curvature of curve $\vec{r}(t)$, $-\pi \le t \le \pi$ at $t = 0$.

$$\vec{r}(t) = e^{-t}\,\vec{i} + \sin t\,\vec{j}$$

(9 points)