Engineering Mathematics 2(013)

Quiz #1

2008.10.01

1. (15) Calculate $\int_C \vec{F}(\vec{r}) \bullet d\vec{r}$ for the following data. If $\vec{F}$ is a force, this gives the work done in the displacement along C.

   $\vec{F} = [\cosh x, \sinh y, e^z]$, C: $r = [t, t^2, t^3]$ from (0, 0, 0) to $\left(\frac{1}{2}, \frac{1}{4}, \frac{1}{8}\right)$

2. (15) Using Green's theorem, evaluate $\int_C \vec{F}(\vec{r}) \bullet d\vec{r}$ counterclockwise around the boundary curve C of the region R.

   $\vec{F} = [-e^y, e^x]$, R the triangle with vertices (0, 0), (2, 0), (2, 1)

3. (10) Evaluate the integral $\iint_S (\nabla \times \vec{F}) \bullet \vec{n} dA$ directly for the given $\vec{F}$ and S.

   $\vec{F} = [4z^2, 16x, 0]$, S: $z = y$ $(0 \le x \le 1, 0 \le y \le 1)$