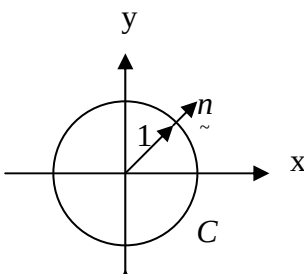
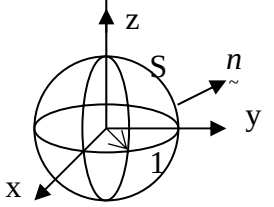
年級：＿＿＿＿＿＿　姓名：＿＿＿＿＿＿＿＿＿＿　學號：＿＿＿＿＿＿＿＿

國立台灣海洋大學河海工程學系２００４工程數學(三)第一次大考模擬考(closed book)

1. $\oint_C \underset{\sim}{r}\cdot\underset{\sim}{n}\,ds = ?$ where $\underset{\sim}{r} = x\underset{\sim}{i} + y\underset{\sim}{j}$ (10%)



2. $\iint_S \underset{\sim}{r}\cdot\underset{\sim}{n}\,dS = ?$ where $\underset{\sim}{r} = x\underset{\sim}{i} + y\underset{\sim}{j} + z\underset{\sim}{k}$ (10%)



3. Fill in the Table (30%)(若是向量請加"~")

	1-D	2-D	3-D
r	$\sqrt{x^2}$	$\sqrt{x^2+y^2}$	$\sqrt{x^2+y^2+z^2}$
$\underset{\sim}{r}$	$x\underset{\sim}{i}$	$x\underset{\sim}{i}+y\underset{\sim}{j}$	$x\underset{\sim}{i}+y\underset{\sim}{j}+z\underset{\sim}{k}$
∇r	$\underset{\sim}{r}/r$		$\underset{\sim}{r}/r$
$\nabla\cdot\underset{\sim}{r}$	1	2	
$\nabla\cdot(\nabla\times\underset{\sim}{r})$			
$\nabla\cdot\nabla(\frac{1}{r})$			
$\nabla\times(\nabla r)$			

4. Explain why Green's theorem can be special case of Guass theorem and Stokes' theorem.(20%)

5. $\oint_C \frac{x}{x^2+y^2}dx + \frac{y}{x^2+y^2}dy = ?$ (30%)