系別:機械與機電工程學系

科目:工程數學

准帶項目請打「V」	
	簡單型計算機
本試題共(包頁,五大題	

1. (15%) Solve 
$$xy' = \frac{y^2}{x} + y$$
.

do agree.

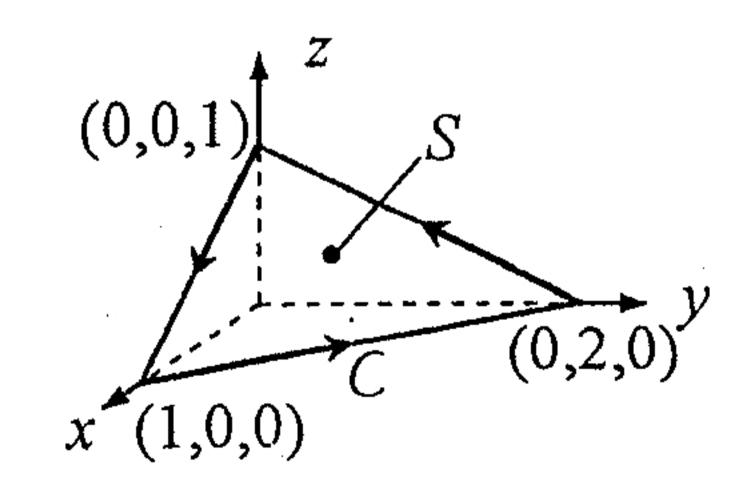
- 2. (20%) Find the general solution of the differential equation.  $y'' - 3y' + 2y = 10\sin(x)$
- 3. (20%) Use the Laplace transform to solve the initial value problem.  $y'' + 2y' + 2y = \delta(t 4)$ ; y(0) = y'(0) = 0
- 4. (20%) Solve the partial differential problem.  $\frac{\partial u^2}{\partial u^2} = \frac{\partial u^2}{\partial u^2}$

$$\frac{\partial u^2}{\partial x^2} + \frac{\partial u^2}{\partial y^2} = 0 \quad (x > 0, y < 0)$$

$$u(x,0) = 0 \quad (x > 0),$$

$$u(0,y) = \begin{cases} 0, & \begin{cases} -5 \le y \le 0 \\ y < -7 \\ 2, & -7 \le y < -5 \end{cases} \end{cases}$$

5. (25%) Evaluate both sides of Stokes's Theorem,  $\oint_C \vec{v} \cdot d\vec{R} = \int_S \vec{n} \cdot \nabla \times \vec{v} \, d\sigma,$  where  $\vec{v} = 2\vec{i} + yz^2\vec{j} + x\vec{k}$  and S is the plane with corners at (1,0,0), (0,2,0), (0,0,1) as shown, and verify that the results



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