

淡江大學 106 學年度進修學士班寒假轉學生招生考試試題

系別：電機工程學系三年級

科目：工程數學

9-1

考試日期：1月6日(星期六) 第2節

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1. $y'(x) + y(x) = \sin x$ (20%)

2. $y''(x) - y'(x) - 6y(x) = 0$, $y(0) = 3$ $y'(0) = 4$ (20%)

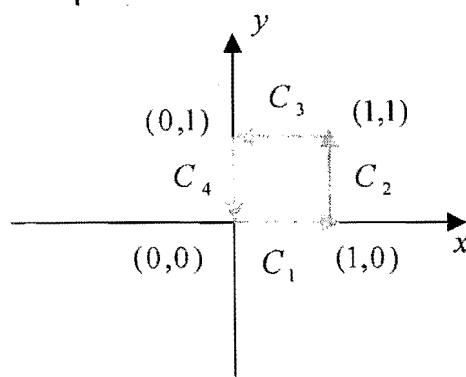
3. $y''(t) + 2y'(t) + 2y(t) = \delta(t-3)$, $y(0) = y'(0) = 0$ (20%)

4. $\vec{F} = f(x, y)\vec{i} + g(x, y)\vec{j} = x\vec{i} + xy\vec{j}$, $\vec{R} = x\vec{i} + y\vec{j}$

(a) $\oint_C \vec{F} \cdot d\vec{R} = ?$ (10%)

*C: the enclosed path by c_1, c_2, c_3 and c_4

(b) $\iint_D \left(\frac{\partial g}{\partial x} - \frac{\partial f}{\partial y} \right) dA = ?$ (10%)



*D: the region enclosed by C

5. Find the Fourier series of $f(x) = \begin{cases} -1, & \text{if } -\pi < x < 0 \\ 1, & \text{if } 0 < x < \pi \end{cases}$ (20%)

and $f(x+2\pi) = f(x)$

