

長庚大學108學年度研究所碩士班招生考試試題

系所：醫學影像暨放射科學系碩士班

考試科目：應用數學

注意：請詳細閱讀下列試題，並請標明題號依試題順序將答案書寫於答案卷上。 本試題共 | 頁：第 | 頁

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Total: 4 problems and 100 points

1. (25 pts) Please use Cauchy-Riemann equations to determine whether a complex function $f(z) = z^2$ is an analytic function, where z is a complex number.
2. (25 pts) Find the Laplace transform of $f(t)$, where $f(t) = t$.
3. (25 pts) Find the Fourier series of $f(x)$, where $f(x) = x^2$ and x is between $-L$ and L .
4. (25 pts) Find the gradient of $f(x, y, z) = x^2 + y^2 + z^2$ in a Cartesian (rectangular) coordinate system.