大同大學　九十五　學年度研究所碩士班入學考試試題

考試科目：微積分　　所別:事業經營研究所　　共壹頁

註:本次考試　不可以參考自己的書籍及筆記；　不可以使用字典；　不可以使用計算器。

1. Define a limit used in Calculus. Using the definition of limit to prove that limit $(3x - 2) = 4$, as $x \to 2$. (10%)

2. Sketch the graph of $y = (x^2 - 1)^{2/3}$ and find every x-value at which the function is not differentiable. (15%)

3. Find the shortest distance from (x_k, y_k) to the line $Ax + By + C = 0$. (15%)

4. Find the sum: $1+3(2!)+7(3!)+13(4!)+21(5!)+\cdots$ to n terms. (15%)

5. Define linear independence of vectors. Let u = (0, -2, 1), v = (4, 1, 0), and w = (-3, -1, 0). Verify that they are linearly independent and express p = (3, 2, -1) as a linear combination of u, v, and w. (15%)

6. Solve the differential equation $(\tan x)\, y'' + y' = \sin x$. (15%)

7. Let R be the region bounded by the square with vertices (0, 0), (7, 3), (3, 3), (4, 0). Evaluate the integral $\int_R \int y(x - y)\, dxdy$. (15%)