淡江大學 98 學年度碩士班招生考試試題

系別：管理科學研究所　　　　　科目：微　　積　　分

1. *Find the limits of the following functions:　(10%)*

   (1) $\lim\limits_{x\to 2}\dfrac{x^2-4}{x-2}$　　(2) $\lim\limits_{x\to 2} x+2$

2. *Find the derivatives of the following functions:　(15%)*

   (1) $f(x)=\dfrac{x^3}{(2-3x)^5}$　　(2) $g(x)=10^{x^5+x}$

   (3) $h(x)=\log(1+x^3)$

3. *Find the nth derivative (n 階導數) of the following function:　(15%)*

   $f(x)=\dfrac{1}{1+x}$

4. *Given* $F(x,y)=x^2+y^2-25=0,$ *find* y' *or* $\dfrac{dy}{dx}$ *and the slope of the*

   graph at $x=3$　*(15%)*

5. *Find the following integrals:　(20%)*

   (1) $\displaystyle\int xe^{2x}\,dx$　　(2) $\displaystyle\int_0^5 \dfrac{x}{x^2+10}\,dx$

6. *Find the local extrema for :　(10%)*

   $f(x,y)=-x^2-y^2+6x+8y-21$

7. *Minimize* $f(x,y)$ *by using method of Lagrange Multipliers:　(15%)*

   $Minimize\ f(x,y)=x^2+y^2$

   $subject\ to\ x+y=10$