

東吳大學 107 學年度暑假轉學生招生考試試題

第 1 頁，共 1 頁

系級	經濟學系二年級	考試時間	100 分鐘
科目	微積分	本科總分	100 分

1. (10%)  $\lim_{x \rightarrow 0^+} (e^x + x)^{1/x} = ?$
2. (10%) Find the area of the region enclosed by the lines  $y = 0$ ,  $x + y = 2$ , and the curve  $y = x^2$
3. (10%) Find the Taylor polynomial of order 3 for the function  $\ln(1 + x^2)$  at  $a = 0$ .
4. (10%) Find all the local maxima, local minima, and saddle points of the function  $f(x, y) = 4xy - x^4 - y^4$ .
5. (10%) Find the extreme values of  $f(x, y) = xy$  subject to the constraint  $x^2 + 4y^2 = 8$ .
6. (10%)  $\int x^3 \ln x \, dx = ?$
7. (10%)  $\int \frac{x^3}{\sqrt{9-x^2}} \, dx = ?$
8. (10%) Find  $f(2)$ , if  $\int_0^x f(t) \, dt = x \cos(\pi x)$ .
9. (10%)  $\int_0^1 \int_y^1 \frac{\sin x}{x} \, dx \, dy = ?$
10. (10%) Find the interval of convergence of the series

$$\sum_{n=0}^{\infty} \frac{(4x - 5)^{2n+1}}{n^{3/2}}$$