

東吳大學 105 學年度轉學生(含進修學士班轉學生)招生考試試題

第1頁，共1頁

系級	資訊管理學系二年級	考試時間	100 分鐘
科目	微積分	本科總分	100 分

- Find the equation of the tangent line at the point (2, 1) for the curve $x^3 - 7 = y^3 + 2x^2y - 8y$. (10%)
- Find the area between the curves $y = x^2 - x + 1$, $y = x^3 - 2x^2 + x + 1$. (10%)
- Find the locations of the absolute extrema for the function $f(x) = \frac{7x^2 + 3x + 7}{x^2 + 1}$. (10%)
- Find the area of the region between the x -axis and the graph of $f(x) = \frac{\ln x^5}{x}$ from $x = \frac{1}{e}$ to $x = e$. (10%)
- Find all values of x for $f(x) = \sqrt{x^3 - 9x^2 + 15x + 1}$ where the tangent line is horizontal. (10%)
- Find the derivative of $y = (8x^4 - 5x^2 + 1)^8$. (10%)
- Find the derivative of $y = (3 + \sqrt{x})(x + 2)$ (10%)
- An analyst has found that a company's costs and revenues in dollars for one product are given by

$$C(x) = 4x^2 - 81x - 500 \quad \text{and} \quad R(x) = \frac{1}{20}x^2 - 2x$$
 - Find the marginal cost function. (5%)
 - Find the marginal profit function. (5%)
 - What value of x makes marginal profit equal 0? (5%)
 - Find the profit when the marginal profit is 0. (5%)
- A retirement saving account contains 300000 and earns 5% interest compounded continuously. The retiree makes continuous withdrawals of 20000 per year. How much will be left in the account after 10 years? (10%)