

大葉大學 95 學年度轉學招生考試試題紙

系 組 別	日 \ 第二部	年級	考 試 科 目 (中 文 名 稱)	考試日期	節次	備註
資訊管理	日	二	微積分	8月7日	3	共乙頁

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶） 11:10 ~ 12:30

1. Let $f(x) = \frac{x}{x^2+1}$. (30%)

- Find the horizontal and vertical asymptotes for the graph of $y = f(x)$;
- Find the critical numbers of f ;
- Determine the open intervals where f is increasing and where it is decreasing ;
- Find the relative maxima and relative minima of f ;
- Find the inflection points of f ;
- Determine the intervals where f is concave upward and where it is concave downward ;
- Sketch the graph of $y = f(x)$;
- Find the absolute maximum and minimum values of f on the interval $[-2, 1/2]$.

2. Find the following integrals. (30%)

(a) $\int \frac{x^2+1}{\sqrt{x}} dx$ (b) $\int_1^2 \frac{1}{x} dx$ (c) $\int_0^1 3^x dx$

3. Find the domain and range for each of the functions defined as follows (15%)

(a) $y = x^2 + 2x + 3$ (b) $y = \sqrt{x-5}$ (c) $y = \frac{1}{x-2}$

4. Find the derivative of the following functions (15%)

(a) $f(x) = (\sqrt[3]{x} + 2)(x^2 - 4x)$ (b) $f(x) = \frac{2x-1}{4x+3}$ (c) $f(x) = 12x^4 - 6\sqrt{x} + \frac{5}{x}$

5. If $g(3) = 1, g'(3) = 2, f(3) = 3$ and $f'(3) = 7$ find $h'(3)$ for $h(x) = \frac{f(x)}{g(x)} + 2f(x)g(x)$ (10%)