

大葉大學 96 學年度轉學招生考試試題紙

學系	部別： 日間部/第二部/進 修學士班/四技	年級	考試科目 (中文名稱)	考試日期	節次	備註
生物產業 科技學系	日間部	二	微積分	7月31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. [18%, 6% each] Find the following limits:

(a) $\lim_{x \rightarrow 0} \left(\frac{1}{\sin x} - \frac{1}{x} \right)$

(b) $\lim_{x \rightarrow 2^-} \frac{|x-2|}{x-2}$

(c) $\lim_{x \rightarrow \infty} \frac{\sqrt{9x+1}}{\sqrt{x+1}}$

2. [18%, 6% each] Find the derivative for following equations:

(a) $v = (1-t)(1+t^2)^{-1}$

(b) $y = (5x^5 - x^3 + 6x)^4$

(c) $y^2 = \frac{x-1}{x+1}$

3. [24%, 6% each] Evaluate the indefinite integrals.

(a) $\int \frac{dx}{\sqrt{5x+8}}$

(b) $\int \sin^5 \frac{x}{3} \cos \frac{x}{3} dx$

(c) $\int x \ln x dx$

(d) $\int \frac{-2x+4}{(x^2+1)(x-1)^2} dx$

4. [10%] Find equations of all lines having slope -1 that are tangent to the curve $y = 1/(x-1)$.

5. [10%] Find the local maximum, minimum and saddle points of the function

$f(x, y) = 2x^2 + 3xy + 4y^2 - 5x + 2y + 3$

6. [20%, 10% each]

(a) Find a power series for $f(x) = 1/(1+x)$.

(b) Evaluate the error when calculate $f(0.05)$ by the first 3 terms in power series.

(Hint: The power series: $\frac{1}{1-x} = 1 + x + x^2 + \dots + x^n + \dots$.)