大葉大學九十學年度轉學招生考試試題紙						
系別	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		二	微積分	七月二十四日	三	

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，一律准攜帶）
詳列計算步驟，否則一概不計分

10% 1. Evaluate (a) $\lim_{x\to 2}\dfrac{4(x^2-4)}{x-2}$ (b) $\lim_{h\to 0}\dfrac{\sqrt{1+h}-1}{h}$

15% 2. Find the values of x for which each of the following functions is continuous.

(a) $f(x)=3x^3+2x^2-x+10$ (b) $g(x)=\dfrac{8x^{10}-4x+1}{x^2+1}$ (c) $h(x)=\dfrac{4x^3-3x^2+1}{x^2-3x+2}$

20% 3. (a) Give the definition of the derivative $f'(x)$ of $f(x)$. (hint: The derivative of a function f with respect to x is the function f' defined by $f'(x)=\lim_{h\to 0}\frac{?}{?},\ldots.)$

(b) Let $f(x)=\dfrac{1}{x}$. Apply (a) to find $f'(x)$.

35% 4. Find the derivative of the following functions:

(a) $f(x)=x^{3.1}$ (b) $f(x)=\dfrac{x-1}{2x+1}$ (c) $f(x)=(x^3+1)^5$

(d) $f(x)=e^{2x^2+x}$ (e) $f(x)=x^x$

10% 5. Let $f(x)=3x$.

(a) Sketch the region R under the graph of f on the interval [0,2] and find its exact area using geometry.

(b) Use a Riemann sum with four subintervals of equal length (n=4) to approximate the area of R. Choose the representative points to be the left endpoints of the subintervals.

10% 6. Find the relative maxima and relative minima of the function $f(x)=x^3-3x^2-24x+32$.