亞洲大學

九十五學年度轉學招生考試試題紙

學系別	考試科目	考試日期	時　　間
電腦與通訊學系大學部三年級	微積分	95.7.29	10:20-12:00

Keep important details of calculation in your answer sheet.

#1. Show $\lim_{(x,y)\to(0,0)} \frac{xy^3}{x^2+y^6}$ does not exist! (9 Points)

#2. Find the derivative $f'(2)$ of following functions $f(x)$. (Each 7 Points)
(a) $f(x) = \ln(x^2+1)$ (b) $f(x) = x^x$ (c) $f(x) = \frac{x\sqrt{x^3+1}}{(3x+2)}$

#3. Evaluate the following indefinite integrals. (Each 10 Points)
(a) $\int e^x \sin x dx$ (b) $\int \frac{x^3}{\sqrt{16-x^2}} dx$ (c) $\int \frac{x^2-x+4}{x(x^2+4)} dx$

#4. If $w(r,\theta) = f(x,y)$,where $x = r\cos\theta, y = r\sin\theta$. Show that $(\frac{\partial w}{\partial \gamma})^2 + \frac{1}{\gamma^2}(\frac{\partial w}{\partial \theta})^2 = (\frac{\partial w}{\partial x})^2 + (\frac{\partial w}{\partial y})^2$.(10 points)

#5. Let R be the triangle in the $xy-$plane bounded by $x-$axis and the line $y = x$ and the line $x = 1$.Calculate $\int\int_R \frac{\sin x}{x} dA$. (10 points)

#6. Let Q be the solid bound by the upper napper of the cone $3z^2 = x^2 + y^2$ and above by the sphere $x^2+y^2+z^2 = 16$. If the density at (x,y,z) is proportional to the its distance from the origin. Find the mass of Q. ..(10 points)

#7. Let $\overrightarrow{F} = \langle e^x \sin 2y, 2e^x \cos 2y + 1\rangle$ be the vector field function on XY space and C represent the path from point $(1,0)$ to point $(0,1)$ along curve $(1-t^2, t^3)$,where $0 \le t \le 1$. Evaluate the work $\int_C \overrightarrow{F} d\overrightarrow{\gamma}$.(10 Points)