銘傳大學 96 學年度研究所碩士班招生考試

管理研究所碩士班(甲組)

應用統計資訊學系碩士班

第四節

微積分試題

(限用答案本作答)

1. (10%) Find the critical number(s) and the absolute maximum and minimum values of $f(x)=\sqrt{9-x^2}$ on [-1,2].

2. (10%) Evaluate $\int_1^{\infty}\frac{\ln x}{x^2}dx$.

3. (10%) Given $x^2-2xy+y^3=5x$, find $\frac{dy}{dx}$.

4. (10%) Find the derivative of $y=\frac{\sqrt[3]{x}(x^2+2)^8e^{7x}}{(2x+1)^5}$.

5. (10%) If the nth partial sum of a series $\sum_{n=1}^{\infty}a_n$ is $s_n=\frac{n-1}{n+1}$, find a_n and $\sum_{n=1}^{\infty}a_n$.

6. (10%) Use Lagrange multipliers to find the maximum and minimum values of $f(x,y)=e^{xy}$ subject to the constraint $x^3+y^3=16$.

7. (10%) Use the definition of the integral (limit of Riemann sum) to evaluate $\int_0^3(1+2x)dx$.

8. (10%) Evaluate $\int_0^1\int_0^{\sqrt{x}}\frac{2y}{1+x^2}dydx$.

9. (10%) Find the derivative of $g(x)=\int_{2x}^{3x}\frac{\sqrt{1+u^4}}{u}du$.

10. (10%) If f is continuous on R, prove that $\int_a^b f(-x)dx=\int_{-b}^{-a}f(x)dx$.

試題完