銘傳大學 98 學年度轉學生招生考試

生物醫學工程學系、電子工程學系

7 月 22 日第三節

微積分試題

（第 1 頁共 1 頁）（限用答案本作答）　　☐可使用計算機 ☑不可使用計算機

<< 不可使用計算機 >>

1. (10%) Find $\int_0^2 \frac{1}{x-1}\,dx$

2. (15%) Find $\int \frac{e^x}{1-e^{2x}}\,dx$

3. (15%) The region enclosed by the curves $y = x$ and $y = \sqrt{x}$ is rotated about the line $x = 1$. Find the volume of the resulting solid.

4. (15%) Find $\iint_R \frac{2y}{x^2+y^2}\,dA$, where R is the region bound by the lines $y = x$, $y = 2x$ and $x = 1$.

5. (15%) Find the limit, if it exists, or show that the limit does not exist.

   (a) $\lim_{(x,y)\to(1,2)} (x^2 + 4xy - 5y^3)$

   (b) $\lim_{(x,y)\to(0,0)} \frac{y^3}{x^3+2y^3}$

   (c) $\lim_{(x,y)\to(0,0)} \frac{xy^2}{x^2+y^4}$

6. (15%) Determine whether the series is convergent or divergent. If it is convergent, find its sum.

   (a) $\sum_{n=2}^{\infty} \frac{1}{n(n-1)}$

   (b) $\sum_{n=0}^{\infty} \frac{2^n}{n!}$

   (c) $\sum_{n=1}^{\infty} \frac{2n^3}{n^3+1}$

7. (15%) Find the Maclaurin series for $f(x) = e^{2x}$.

<< 試題結束 >>

試題完