題號：25　　國立臺灣大學106學年度轉學生招生考試試題

科目：微積分(C)

※禁止使用計算機

※ 注意：請於答案卷上依序作答，並應註明作答之大題及其題號。

1. $\lim_{x\to\infty}\left(x-\sqrt{x^2+2x}\right)$ =? **(10%)**

2 Find $\frac{d}{dx}2^{(x^2)}$ =? **(10%)**

3 It is known that $2x^3+y^3=5xy$. Determine the value of dy/dx when (x,y)=(1,2). **(10%)**

4 Find the arc length determined by the curve $y=\frac{1}{12}x^3+\frac{1}{x}$ over $1\le x\le 2$. **(10%)**

5 $\int_0^{\pi}(cos^2x+sec^2x)\,dx$ =? **(10%)**

6 $1-\frac{1}{3}+\frac{1}{5}-\frac{1}{7}+\frac{1}{9}-\frac{1}{11}+\cdots$ =? **(10%)**

7 $\int_0^1\left[\int_y^1 \sin x^2 dx\right]dy$ =? **(10%)**

8 When $2x^2-4xy+5y^2=1$, $f(x,y)=x^2+y^2$, determine the maximum value and minimum value of f(x,y). **(10%)**

9 $\int_0^{\infty}\exp(-2x^2)dx$ =? **(10%)**

10 y=f(x) satisfies $\frac{dy}{dx}=2\frac{y}{x}$. When x=1, y=2, what is f(x)? (10%)

試題隨卷繳回