國立屏東大學 104 學年度研究所碩士班入學考試

微積分 試題

（應用數學系碩士班）

※請注意：答案須寫在答案卷上，否則不予計分。

計算題（每題 10 分，共 100 分）

1、Find $\lim\limits_{x\to\infty} e^{-x}\sqrt{x+2015}$.

2、Find the derivatives of the functions: (a) $f(x)=e^{\sin x}$, (b) $g(x)=\ln(\frac{x}{x+1})$.

3、Find the derivative of the function $F(x)=\int_0^{\sin x}\cos t\,dt$.

4、Find $\int_0^{\infty} e^{-x}dx$.

5、Find the arc length of the graph of $y=\frac{3}{2}x^{\frac{2}{3}}$ on the interval $[1,8]$.

6、Find the tangent line to the graph $x^2+y^2=4$ at the point $\left(\sqrt{2},-\sqrt{2}\right)$.

7、Find the point on the graph of $y=(x-1)^2$ that is closest to the point $(-5,3)$.

8、Find the area of the region bounded by the graphs of $x=3-y^2$ and $x=y+1$.

9、Compute the integral $\int\dfrac{1}{x(1+x)}dx$.

10、Evaluate the integral $\int_0^1\int_y^1 e^{-x^2}\,dx\,dy$.