

# 國立屏東大學 104 學年度學士班轉學考試

## 微積分(B) 試題

### (應用數學系)

\*注意事項：

(1) 本試題共 1 頁。

(2) 不必抄題，但請依序將題號標出，並寫在答案紙上，否則不予計分。

1. Which points on the graph of  $y = 4 - x^2$  are closest to the point  $(0, 2)$ ? (10 分)
2. Find  $\int_0^1 x^3 e^x dx$ . (10 分)
3. Evaluate the iterated integral  $\int_0^2 \int_{y^2}^4 \frac{y}{1+x^2} dx dy$ . (10 分)
4. Evaluate  $\lim_{x \rightarrow \infty} \left(1 + \frac{1}{2x}\right)^x$ . (10 分)
5. Solve the first-order linear differential equation  $\frac{dy}{dx} + 2xy = 2x$ . (10 分)
6. Find  $f'(t)$  given that  $f(t) = \sin^3 4t$ . (10 分)
7. Find  $\frac{dy}{dx}$  given that  $y^3 + y^2 - 5y - x^2 = -4$ . (10 分)
8. Find  $\lim_{x \rightarrow 0} \frac{\tan x}{x}$ . (10 分)
9. Find the  $n$ -th Maclaurin polynomial of  $f(x) = e^x$ . (10 分)
10. Find the volume of the solid formed by revolving the graph bounded by the graph of  $f(x) = \sqrt{\sin x}$  and the  $x$ -axis ( $0 \leq x \leq \pi$ ) about the  $x$ -axis. (10 分)