

國立屏東大學 105 學年度學士班暨進修學士班轉學考試

微積分 試題

(資訊工程學系學士班/資訊科學系學士班)

*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。

一、計算題(每題 10 分，共 100 分)

1. Find the derivative of $f(x) = (3x - 2x^2)(5 + 4x)$.
2. Find the Maclaurin series of $f(x) = \sin x^2$.
3. Find the derivative of $f(x) = 4\ln(x^2) - \tan x - \sin^{-1}x$.
4. Find the extreme of $f(x) = 3x^4 - 4x^3$ on the interval $[-1, 2]$.
5. Find the derivative of

$$f(x) = \int_{-x}^{x^3} \sin t dt$$

6. Find $\int \sin^2 3x \cos 3x dx$
7. Find $\int_1^5 \frac{x}{\sqrt{2x-1}} dx$
8. Find the area of the region bounded by the graph of $y = \frac{x}{x^2+1}$, the x-axis and the line $x = 3$.
9. Find $\int x^2 \sin x dx$
10. Find $\int_{\sqrt{3}}^2 \frac{\sqrt{x^2-3}}{x} dx$