

國立屏東大學 104 學年度學士班轉學考試

微積分(A) 試題

(資訊工程學系/資訊科學系)

*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。

一、計算題(每題 10 分，共 100 分)

1. Find the derivative of the function $f(x) = \sin \sqrt[3]{x} + \sqrt[3]{\sin x}$.
2. Find $\frac{dy}{dx}$ given that $\sqrt{xy} = x^2y + 1$.
3. Find the integral $\int x \ln(x+1) dx$.
4. Find the volume of the solid generated by revolving the region bounded by $y = \sqrt{x}$, $y = 0$ and $x = 3$ about the line $x = 6$.
5. Evaluate f_x, f_y , and f_z of the function $f(x, y, z) = \frac{xy}{x+y+z}$ at the point $(3, 1, -1)$.
6. Find $\partial w / \partial s$ and $\partial w / \partial t$ by using the appropriate chain rule, where $w = y^3 - 3x^2y$, $x = e^s$, $y = e^t$
7. Evaluate the iterated integral: $\int_0^1 \int_0^{\sqrt{1-y^2}} (x+y) dx dy$
8. Find the integral: $\int x^2 \cos x dx$
9. Find $\frac{dy}{dx}$ given that $x^3 - xy + y^2 = 7$
10. Find $\int_0^\infty x e^{-x} dx$