考 試 科 目｜微積分 4192　系所別｜科管智財所（科管財組）　考試時間｜2 月 18 日（六）第 一 節

注意事項:

一、 每題皆請詳列計算過程，無計算過程僅寫答案者不予計分。

二、 請勿使用任何形式之計算機或計算器

題目：

1. Please find the line tangent to the curve $y^2-4x^2+8y+20=0$ at the point (3, 2). (10%)

2. Please find the line normal to the curve $y^2-4x^2+8y+10=0$ at the point (4, 4). (10%)

3. Please solve the differential equation $\frac{dy}{dx} = 3x^2\sqrt{y}$, y>0. (10%)

4. Please solve the equation $e^{3y} = 3 + \sin x$. (10%)

5. Please find $\frac{d}{dx}\sin^{-1} y$, if y=x². (10%)

6. Please find $\int_{\frac{\pi}{2}}^{\frac{\pi}{2}} \cos x \sqrt{(1 + \sin x)}\, dx$. (10%)

7. Please solve the equation $\frac{d^2y}{dx^2} - \frac{dy}{dx} + 2y = 0$. (20%)

8. Please find the following integral and draw the area

$\int_0^\pi \int_0^x 2x \sin y\, dy\, dx$. (20%)

備　註｜一、作答於試題上者，不予計分。
二、試題請隨卷繳交。