

國立宜蘭大學 104 學年度第 1 學期 期末 考試試題紙			第 頁
考 試 科 目	班 級	學 號	姓 名
微積分一			

1. Find the average value of  $f(x) = 3x^2 - 2x$  on the interval  $[1, 4]$ . (10 points)

2. Find the indefinite integral. (30 points)

(a)  $\int \frac{1}{\theta^2} \cos \frac{1}{\theta} d\theta$

(b)  $\int (\sec t + \tan t) dt$

(c)  $\int \frac{\cosh x}{\sinh x} dx$

3. Find the definite integral. (30 points)

(a)  $\int_1^9 \frac{1}{\sqrt{x}(1+\sqrt{x})^2} dx$

(b)  $\int_0^{\ln 2} 2e^{-x} \cosh x dx$

(c)  $\int_0^{1/\sqrt{2}} \frac{\arccos x}{\sqrt{1-x^2}} dx$

4. Find the volume of the solid formed by revolving the region bounded by the graphs of  $y = x^2 + 1$ ,  $y = 0$ ,  $x = 0$ , and  $x = 1$  about the y-axis. (Using the Disk Method) (20 points)

5. Find the area of the region between the graphs of  $f(x) = 3x^3 - x^2 - 10x$  and  $g(x) = -x^2 + 2x$ . (10 points)