

靜宜大學 106 學年度碩博士班暨碩士在職專班招生考試試題

學系：財務與計算數學系

科目：微積分

1. (8 pts) $y = \int_{x^2}^2 \cos^2(\pi t) dt$, $\frac{dy}{dx} =$

2. (8 pts) $\lim_{x \rightarrow 0} \frac{\sin(5x)}{2x} =$

3. (8 pts) $\lim_{x \rightarrow 0} \frac{\cos x - 1}{x^2 + x} =$

4. (8 pts) $\lim_{x \rightarrow 0} \left(\frac{1}{\sin x} - \frac{1}{x} \right) =$

5. (8 pts) $\frac{d}{dx} \ln(\tan^{-1}(x^2 + 1)) =$

6. (10 pts) $\int_1^2 \ln x dx =$

7. (10 pts) $\int \sin^3 x \cos^4 x dx =$

8. (10 pts) $\int x^2 \cos x dx =$

9. (15 pts) Find the area between $y = 2 - x^2$ and $y = -x$

10. (15 pts) $S(t) = 2t^3 - 14t^2 + 22t - 5$

A. Find the critical points

B. Use the first derivative test to find local extreme values

C. Use the second derivative test to find local extreme values.