

靜宜大學 100 學年度碩士班暨碩士在職專班招生考試試題

學系：財務與計策數學 科目：微積分

計算題：(每題 10 分) (請寫清楚計算過程)

1. $\int_1^3 \frac{\ln x}{x} dx = ?$

2. If $G(x) = \int_1^{x^2} \frac{1}{t^2 + 1} dt$, then $G'(x) = ?$

3. $\lim_{n \rightarrow \infty} \sum_{k=1}^n \left[\sin\left(\frac{\pi k}{n}\right) \right] \frac{\pi}{n} = ?$

4. $\int \frac{x-7}{x^2-x-12} dx = ?$

5. If $y(t)$ satisfies $y' = y(1-y)$, $y(0) = 0.5$, then $y(t) = ?$

6. $\frac{d}{dx} x^x = ?$

7. Find the equation of the tangent line to the function $\frac{1}{x^2 + 4}$ at the point $(1, 0.2)$.

8. $\lim_{x \rightarrow 0} \frac{1 - \cos x}{\sin^2 x} = ?$

9. If $e^x \cos x = \sum_{n=0}^{\infty} a_n x^n$, then $a_2 = ?$

10. If $f(x) = x|x-1|$, then $f'(0) = ?$