

淡江大學八十八學年度日間部轉學生招生考試試題

系別：商管組二年級

科目：微積分

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本試題背面印製

9. The Lorenz curve for wealth in Great Britain is $L(x) = x^{1.3}$.
Then, the Gini index is _____.

10. The relative rate of change of $f(t)$ is the derivative of the natural logarithm of $f(t)$. If the gross national product t years from now is predicted to be $G(t) = 1.2 e^{\sqrt{t}}$ trillion dollars, then, the relative rate of change 25 years from now is _____%.

二. A company's annual revenue after x years is $f(x) = x^3 - 9x^2 + 15x + 25$ thousand dollars (for $x \geq 0$).

- (a) Sketch the graph of the revenue function, showing all relative extreme points and inflection points. (10%)
- (b) Interpret the inflection point. (5%)

三. Suppose that sales for a fashion item are $\cos t^2$ in year t , so that extra sales during the first x years are $\int_0^x \cos t^2 dt$ (in thousands dollars).

- (a) Find the Taylor series at 0 for $\cos t^2$. (5%)
- (b) Integrate this series from 0 to x , obtaining a Taylor series for the integral $\int_0^x \cos t^2 dt$. (5%)
- (c) Estimate $\int_0^1 \cos t^2 dt$ by using the first three terms of the series found in part (b) evaluated at $x=1$. (5%)

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注意：第一題為填充題，請在答案紙上依序寫上小題號，
只需寫答案，不必寫出演算過程。

第二、三題必須寫出演算過程。

一. 填充題 (共 10 題，每小題 7 分)

1. $\frac{d}{dx} (3x^2(x^3-3)^4) = \underline{\hspace{2cm}}$.

2. $\frac{d}{dx} \sqrt{\frac{4x^4+1}{2x^2+1}} = \underline{\hspace{2cm}}$.

3. $\lim_{x \rightarrow 2} \frac{x^2+x-6}{x^2+6x-16} = \underline{\hspace{2cm}}$.

4. $\lim_{x \rightarrow 0} \frac{\ln(1+4x)}{x} = \underline{\hspace{2cm}}$.

5. $\int (x+1) \sin(x^2+2x) dx = \underline{\hspace{2cm}}$.

6. $\int_1^8 \frac{e^{\sqrt[3]{x}}}{\sqrt[3]{x^2}} dx = \underline{\hspace{2cm}}$.

7. $\int x^2 e^x dx = \underline{\hspace{2cm}}$.

8. $\int \frac{1}{x^2-4} dx = \underline{\hspace{2cm}}$.

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◀ 注意背面尚有試題 ▶

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