

# 國立中央大學八十八學年度碩士班研究生入學試題卷

所別: 企業管理研究所 甲組 科目: 微積分 共 1 頁 第 1 頁

- (a) For  $x > 0$ , let  $g(x) = e^{\sin x}$ . Find  $g'(x)$ . (10分)

(b) For  $x > 0$ , let  $h(x) = x^x \cdot \cos x$ . Find  $h'(x)$ . (10分)
- (a) Evaluate  $\int_0^{10} (100 + 10x) e^{-0.1x} dx$ . (10分)

(b) Explain why  $0 < \int_0^1 e^{x^2} dx < 3$ . (10分)
- If you need \$10,000 in your bank account 3 years from now and the annual interest rate on your account is 6% compounded monthly, how much should you deposit now? (15分)
- IQ scores are believed to be normally distributed with mean 110 and standard deviation 10. Estimate the fraction of the population with IQ between 120 and 130. (15分)
- What is the shortest distance between the point  $(5, -100, 20)$  and the plane  $4x + 3z - 50 = 0$ ? (15分)
- Prove or disprove that  $\lim_{(x,y) \rightarrow (0,0)} \frac{xy}{x^2 + y^2} = 0$ . (15分)

參考