

大葉大學 九十二 學年度 研究所碩士班 招生考試試題紙

系 所 別	組 別	考 試 科 目 (中文名稱)	考 試 日 期	節 次	備 註
Graduate Management	A	Calculus	4月13日	第一節 08:30~10:00	Scientific Calculator is allowed

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

1. The profit function of the Chung Hua Corporation is given by

$$P(x) = -0.02x^2 + 300x - 200,000$$

dollars, where x is the number of Chung Hua model F loudspeaker systems produced. Find where the function P is increasing and where it is decreasing.

(25%)

2. A study prepared by the marketing department of the Acer Corporation forecasts that, after its new line of Galaxy Home computers is introduced into the market, sales will grow at the rate of

$$2000 - 1500e^{-0.05t} \quad (0 \leq t \leq 60)$$

units per month. Find an expression that gives the total number computers that will sell t months after they become available on the market. How many computers will Acer sell in the first year they are on the market?

(25%)

3. Tai-Ta Car Wash recently bought an automatic car-washing machine that is expected to generate \$40,000 in revenue per year, t years from now, for the next 5 years. If the income is reinvested in a business earning interest at the rate of 12% per year compounded continuously, find the total accumulated value of this income stream at the end of 5 years. [Hint:

$$A = e^{rT} \int_0^T R(t)e^{-rt} dt]$$

(25%)

4. The total sales of the Yuan-Li Security Corporation in its first 2 years of operation are given by

$$S = f(t) = \frac{0.3t^3}{1+0.4t^2} \quad (0 \leq t \leq 2)$$

where S is measured in millions of dollars and $t=0$ corresponds to the date Yuan-Li Security began operations. How fast was the sales increasing at the beginning of the company's second year of operation?

(25%)