

# 淡江大學 97 學年度碩士班招生考試試題

系別：財務金融學系

B 組

科目：微 積 分

准帶項目請打「V」

簡單型計算機

本試題共 1 頁，5 大題

※ Each question is 20 point. ※ Answer all questions.

## Question 1

For a cost function  $C(x) = 1600 + 200x + 4x^{3/2}$  (given in dollars)

Find

- (a) the cost, average cost, and marginal cost at a production level of 1000 units;
- (b) the production level that will minimize the average cost; and
- (c) the minimum average cost.

## Question 2

Use the Fundamental Theorem of Calculus 10 evaluate each of the following integrals:

(a)  $\int_1^3 x^2 - 4x^3 + 7dx$

(b)  $\int_1^4 \left(\frac{\ln x}{x}\right) + x \sin x^2 dx$

## Question 3

Determine whether the given function  $f$  is continuous at given point  $c$ . Give careful justification of your answer

(a)  $f(x) = \frac{x-1}{x+1}$ ,  $c = -1$

(b)  $f(x) = \begin{cases} x^2 & \text{if } x \leq 1 \\ x & \text{if } x > 1 \end{cases}$   $c = 1$

## Question 4

A water tank has a submerged window that is in the shape of a circle of radius 2 feet. The center of this circular window is 8 feet below the surface.

Set up, but do not calculate, the integral for the pressure on the lower half of this window—assuming that water weighs 62.4 pounds per cubic foot.

## Question 5

Use integration by parts to evaluate each of the following indefinite Integrals

(a)  $\int \log^2 x dx$ .

(b)  $\int x^2 e^{4x} dx$