

淡江大學 96 學年度轉學生招生考試試題

7

系別：商管組二年級

科目：微 積 分

可否使用計算機			
可		否	✓

本試題共 / 頁

1. (10%) For the piecewise linear function

$$f(x) = \begin{cases} 3-x & \text{if } x \leq 2 \\ 10-2x & \text{if } x > 2 \end{cases}$$

, find (a) $\lim_{x \rightarrow 2^-} f(x)$ (b) $\lim_{x \rightarrow 2^+} f(x)$ (c) $\lim_{x \rightarrow 2} f(x)$.

2. (10%) Find the equation of the tangent line to $f(x) = 2x^3 - 5x^2 + 7$ at $x = 2$.

3. (10%)(a) Find $\frac{d}{dx} \left(\frac{\sqrt{x}}{x^2+1} \right)$. (b) Find $\frac{d}{dx} (\ln(x^2+1))^3$

4. (10%) Find the absolute extreme values of $f(x) = x^3 - 9x^2 + 15x$, on $[0,3]$.

5. (10%) A furniture showroom expects to sell 250 sofas a year. Each sofa costs the store \$300, and there is a fixed charge of \$500 per order. If it costs \$100 to store a sofa for a year, how large should each order be and how often should orders be placed to minimize inventory costs.

6. (10%) For equation $x^3 = (y-2)^2 + 1$, find $\frac{dy}{dx}$ implicitly.

7. (10%) (a) Find $\int \left(\sqrt{x} + \frac{1}{\sqrt{x}} \right) dx$. (b) $\int_1^2 x^2 dx$.

8. (10%) Find $\int \left(\frac{1}{x^2-9} \right) dx$.

9. (10%) Find $\int x e^x dx$.

10. (10%) Evaluate $\int_0^1 \int_0^2 (3x^2 + 6xy^2) dx dy$.