

系所組別： 海洋科技與事務研究所

考試科目： 數學

考試日期： 0219 · 節次： 3

※ 考生請注意：本試題 可 不可 使用計算機

1. You are asked to (15%)

(1) Find the limit, $\lim_{x \rightarrow \pm\infty} \frac{5x^2}{x^2 + 1}$ (7%)(2) Sketch the graph of the equation $y = \frac{5x^2}{x^2 + 1}$ (8%)2. If $f(x) = \sqrt{3 + x^2}$, you are asked to (15%)(1) Find the first derivative of $f(x)$ (7%)(2) Find the second derivative of $f(x)$ (8%)3. Find $\int_1^2 \frac{x^2 + 3}{x^2} dx$ (15%)4. Find $\int_1^3 3x\sqrt{x^2 - 1} dx$ (15%)5. Find $\int \frac{3x^3}{\sqrt{x^2 + 1}} dx$ (15%)

6. Find the solutions of the system of linear algebraic equations (10%)

$$2x + y = 4$$

$$5x - 2y = 1$$

7. Find the solutions of the system of linear algebraic equations (15%)

$$2x - y + 3z = 3$$

$$-x + 2y = 1$$

$$3x - 5y + 2z = 1$$