

系所組別：民航研究所乙組

考試科目：微積分

考試日期：0211，節次：3

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※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. 20%) Find the area A under the graph

$$y = \frac{2}{x(x+2)}$$

on the interval [1,6].

2. 20%) Compute the summation of the following

a)
$$\sum_{n=1}^{\infty} \frac{4}{n(n+4)}$$

b)
$$\sum_{n=1}^{\infty} \frac{1}{3^n}$$

3. 20%) Evaluate the line integral

$$\int_C ydx - xdy + zdz$$

If C is given by $x = t, y = t^2, z = t^2; \quad 1 \leq t \leq 2.$

4. 20%) Find an equation of the tangent plane to the graph of the given equation at the indicated point:

$$x^2 + y^3 - 2z = 3; \quad (1,2,3)$$

5. 20%) Find the general solutions:

a)
$$\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + 6y = 0$$

b)
$$x^2 \frac{d^2y}{dx^2} + 2x \frac{dy}{dx} - 6y = 0$$