

복소함수론 실적분 실기시험

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1 Evaluate the following integrals with the proof of the convergence: (20 점 x 5 = 100 점)

$$\text{a) } \int_{-\infty}^{\infty} \frac{dx}{x^2 + x + 1}$$

$$\text{b) } \int_0^{\infty} \frac{x^2 \cos 3x}{(x^2 + 1)^2} dx$$

$$\text{c) } \int_0^{\infty} \frac{\sin x}{x} dx$$

$$\text{d) } \int_0^{\infty} \frac{dx}{x^3 + 8}$$

$$\text{e) } \int_0^{\infty} \frac{\sqrt[3]{x} \ln(x)}{x^2 + 1} dx$$

2 Evaluate the integrals:(10 점 x 2 = 20 점)

$$\text{a) } \int_0^{\pi} \frac{d\theta}{2 + \cos \theta}$$

$$\text{b) } \int_0^{2\pi} \frac{d\theta}{(2 + \cos \theta)^2}$$

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총점 120점